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## INFLUENZA IN FOREIGN COUNTRIES

The following information relative to the prevalence of influenza in foreign countries was received by the health section of the secretariat of the League of Nations from the health administrations of the various countries. These data are supplemental to the report published in the Public Health Reports of February 4, 1927, page 283.

*Austria*.—(January 14.) Influenza is not epidemic in Austria.

*Bulgaria*.—(January 11.) Usual seasonal incidence of influenza.

*Egypt*.—(January 13.) Influenza cases reported in Egypt during December numbered 171; deaths from influenza, 38.

*England*.—The following comment on the mortality returns for large towns of England and Wales is made by the British Ministry of Health:

Influenza deaths in London and the 105 great towns in England and Wales remained steady and at a low level, but during the week ended January 8 there was a sharp rise in the numbers returned by both London and the other great towns. In London the pneumonia mortality for the week ending January 1 was slightly higher than during the previous four weeks, and the bronchitis mortality showed a considerable increase. The notifications of acute primary pneumonia and acute influenzal pneumonia, however, showed no material increase up to January 1 and are less than those returned for the weeks ending December 11 and 18.

Speaking generally, the death certificates of influenza and the notifications of pneumonia in the week ending January 8, 1927, are slightly more numerous than in the comparable periods of 1925 and 1926. The seasonal rise in the occurrence of this disease and its sequelæ came later than January in the years 1925 and 1926.

*Deaths from influenza and related causes in large English towns November 28, 1926, to January 8, 1927*

Week ending—	Influenza		London	
	105 great towns	London	Bronchitis	Pneumonia
Dec. 4, 1926	68	14	91	104
Dec. 11, 1926	52	13	105	129
Dec. 18, 1926	60	18	112	135
Dec. 25, 1926	60	16	95	116
Jan. 1, 1927	86	17	162	176
Jan. 8, 1927	172	72	218	224

*Estonia.*—(January 13.) A mild outbreak of influenza occurred at the beginning of November. The situation is now normal.

*Finland.*—(January 13.) There is no influenza epidemic in Finland.

*France.*—Six deaths from influenza have been reported at Lille during the week ending January 1, as compared with 12 during the preceding week, and 7 during the week ended December 18.

*Germany.*—(January 14.) Influenza has been increasing in certain parts of Germany since the beginning of January; the type is generally benign. The Berlin General Sickness Insurance Institute (Allgemeine Ortskrankenkasse) reported 720 new influenza cases on January 10, 1,042 on January 11, and 1,043 cases on January 12 (682 cases on January 6). Five deaths of its members have been attributed to influenza since the beginning of January.

*Greece.*—(January 12.) Influenza epidemic appeared one month ago; quite mild type, affections of respiratory system predominant.

*Hungary.*—(January 11.) No case of epidemic influenza has been reported in Hungary since the beginning of December.

*India.*—Returns of infectious diseases for the week ending December 25 include three deaths from influenza in Bombay Presidency, two deaths in Bihar and Orissa and nine deaths in Bengal. No death was reported from the other Provinces. It appears therefore that influenza is not seriously prevalent at present in India.

*Irish Free State.*—Influenza has not been prevalent in Ireland during the present winter. There were four deaths from influenza at Dublin during the week ending December 25, two deaths during the week ending January 1, and only one death during the week ending January 8, 1927.

*Italy.*—(January 13.) No center of epidemic influenza exists in Italy and the health conditions are very good.

*Latvia.*—(January 11.) Influenza present but not epidemic.

*Lithuania.*—(January 15.) Influenza is not uncommon but no marked increase has occurred during recent weeks. The notifications of this disease numbered 472 in November and 390 in December.

*Netherlands.*—Thirteen deaths were attributed to influenza in the city of Amsterdam during the week ending January 1, as compared with 4 during the preceding week; deaths from all causes numbered 161 during the week, as compared with 116 during the previous week.

*Norway.*—(January 12.) In 21 towns including Bergen: Influenza, 2,754 cases, 11 deaths; pneumonia, 158 cases, 23 deaths; bronchitis, 2,142 cases, 5 deaths. No increased virulence of type has been reported.

*Poland.*—(January 11.) Influenza is reported at Warsaw, Lemberg, Cracow. The form is mild and the mortality very low; complications, mostly pulmonary, are rare. Neither incidence nor

mortality is higher than during the corresponding season last year. Notification of influenza cases is being made compulsory in large towns.

*Rumania.*—(January 13.) Very mild influenza epidemic in the army and civil population. Hardly any fatal cases. Prevailing clinical type, bronchial. Local sanitary administrations report no spread. No special sanitary measures taken.

*Scotland.*—The following table gives the number of deaths from influenza and from respiratory diseases, by weeks, November 28, 1926, to January 8, 1927. The registrars' offices were closed on December 25 and January 1, and some registrations were probably carried over to the following weeks. This would tend to reduce the number of deaths registered during the week ending December 25, and increase the number for the week ending January 8.

Week ending—	Influenza			Respiratory diseases		
	Glasgow	Edin- burgh	14 other towns	Glasgow	Edin- burgh	14 other towns
Dec. 4, 1926.....	4	3	3	84	20	32
Dec. 11, 1926.....	5	3	2	84	27	41
Dec. 18, 1926.....	5	1	.....	86	15	60
Dec. 25, 1926.....	4	2	3	62	9	46
Jan. 1, 1927.....	4	2	6	95	24	56
Jan. 8, 1927.....	5	1	7	98	37	57

*Kingdom of the Serbs, Croats, and Slovenes.*—(January 11.) Influenza has been prevalent since December; the type is mild catarrhal. Fatal cases minimal.

*Spain.*—(January 16.) The influenza has spread to 35 Spanish Provinces and to Las Palmas (Gran Canaria). In all these Provinces it showed a benign character. In Barcelona, Bilbao, and the other Provinces it is on the decrease, and in the Provinces of San Sebastian, Valence, and Madrid the situation is about the same. In the latter Province the death rate increased during the week of January 9 to 16, owing to influenza, heart, and respiratory diseases, and is twice as much as during normal periods.

*Switzerland.*—There were 80 deaths from influenza in Swiss towns during the week ending January 1, as against 31 during the previous week. The number of deaths occurring in each town is specified below.

*Deaths from influenza in Swiss towns during the week ending January 1, 1927*

Zurich.....	5	Montreux.....	1
Basle.....	14	Herisau.....	1
Geneva.....	30	Soleure.....	1
Bern.....	8	Vevey.....	1
Lausanne.....	3	Locle.....	2
Chaux de Fonds.....	2	Granges.....	1
Bienne.....	3		
Neuchatel.....	4	Total.....	80
Friburg.....	4		

## LATER INFORMATION

A telegram from the health section of the Secretariat of the League of Nations dated February 4, 1927, gives the following later information:

Influenza is abating in the southern districts of England, but spreading in the midland districts. The north of England is comparatively free from the disease. Scotland and Ireland are reported practically free from the disease. A mild form of influenza is spreading in Sweden, Finland, Czechoslovakia, Bulgaria, and Macedonia. It is decreasing in France, Belgium, Netherlands, Spain, Switzerland, and Poland, and in Berlin. No unusual prevalence of influenza is reported from Italy, Russia, North Africa, India, or Australia. Outbreaks were reported in Korean towns.

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TOXIC EFFECTS OF ETHYLENE DIBROMIDE<sup>1</sup>

By B. G. H. THOMAS, Assistant Pathologist, and W. P. YANT, Associate Chemist, Pittsburgh Experiment Station, United States Bureau of Mines

In connection with a recent investigation of the toxic effects of ethyl gasoline,<sup>2</sup> the Bureau of Mines had occasion to make a brief study of the acute toxic effects of ethylene dibromide<sup>3</sup> on guinea pigs and rats. No attempt was made to determine the minimum lethal dose. However, the results of the study indicate that it is very toxic and that precaution is necessary to obviate poisoning in the manufacture of ethylene dibromide.

Ethylene dibromide,  $C_2H_4Br_2$ , is a colorless, volatile, emulsifiable liquid, which has a chloroformlike odor. Its boiling point is 129°-131° C., and its specific gravity is 2.189. Ethylene dibromide is insoluble in water but soluble in alcohol, ether, and gasoline.

## APPARATUS USED

The essential feature of the apparatus<sup>4</sup> used for inhalation experiments on guinea pigs (see accompanying figure) is that water drops in *c* from the reservoir *r* at a constant, regulated rate, forcing the mercury to rise in *b* and expelling a constant definite amount of ethylene dibromide on the wick *e*, which is completely evaporated by a constant stream of air so regulated as to give the desired vapor-air mixture which flows into the chamber *j*.

<sup>1</sup> Published with approval of the Director, U. S. Bureau of Mines. Manuscript submitted for publication October 16, 1926.

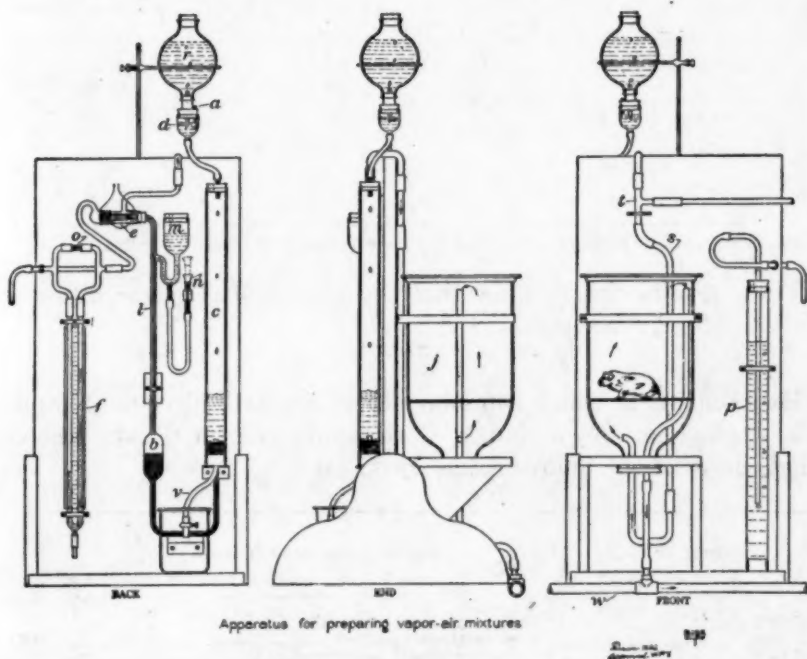
<sup>2</sup> This study was conducted in cooperation with the Ethyl Gasoline Corporation.

<sup>3</sup> Ethylene dibromide is a component of ethyl gasoline (approx. 2 cc. per gallon of gasoline), as sold at the time of the investigation.

<sup>4</sup> Yant, W. P., and Frey, F. E.: Apparatus for preparing vapor-air mixtures of constant composition. Ind. and Eng. Chem. vol. 17, 1925, pp. 692-694.



Experiments were also conducted on rats, on which the material was applied on the abdomen. The animals were tied on a board by their feet, which were stretched out to each corner, which made it impossible for them to lick their abdomen. They were placed under an inclosed hood in which there was a good upward suction of air, such as is found in a chemical laboratory. The abdomen was shaved 30 minutes before the fluid was applied. The liquid was gradually applied on the skin by means of a pipette so that it wetted



an area of 2 centimeters square. The site of application was dry before the animals were removed from the board, and when freed they made no attempt to lick the abdomen while under observation for six hours.

Tissues of the guinea pigs dying from inhaling ethylene dibromide were prepared for microscopic examination by fixing in Zenker's solution, embedding in paraffin, sectioning, staining with Bullard's hematoxylin, and counterstaining with anilin acid fuchsin and Biebrich scarlet.

## RESULTS OF EXPERIMENTS

## GUINEA PIGS

Nine guinea pigs divided into three equal groups were subjected to single exposures of vapors of commercial ethylene dibromide as follows:

Animal No.	Vapor concentration, per cent in air	Length of exposure, minutes	Result, hours survived
E Br 4.....	0.8	30	16 to 18
E Br 5.....	.8	30	16 to 18
E Br 6.....	.8	30	16 to 18
E Br 1.....	.4	60	16 to 18
E Br 2.....	.4	60	16 to 18
E Br 3.....	.4	60	16 to 18
E Br 7.....	.2	150	16 to 18
E Br 8.....	.2	150	16 to 18
E Br 9.....	.2	150	16 to 18

<sup>1</sup> The animal was alive at the end of six hours, but was found dead the following morning.

These results clearly show that the vapors of ethylene dibromide are toxic for guinea pigs.

## RATS

Experiments in which commercial and purified ethylene dibromide was applied on the abdomen were conducted on 6 rats receiving single doses of the following amounts:

Animal No.	Amount of ethylene dibromide	Result, hours survived
11 E Br 1.....	1 cubic centimeter commercial.....	6
11 E Br 4.....	1 cubic centimeter purified.....	16 to 18
11 E Br 2.....	0.5 cubic centimeter commercial.....	16 to 18
11 E Br 5.....	0.5 cubic centimeter purified.....	16 to 18
11 E Br 3.....	0.25 cubic centimeter commercial.....	16 to 18
11 E Br 6.....	0.25 cubic centimeter purified.....	16 to 18

<sup>1</sup> The animal was alive at the end of six hours, but was found dead the following morning.

These experiments clearly indicate that 0.25 cubic centimeter of ethylene dibromide applied on the abdomen of rats will cause death within 24 hours.

## DIGEST OF GROSS AND MICROSCOPIC AND PATHOLOGIC CHANGES

*External appearance.*—At autopsy no external body changes were visible to the eye and particular note was taken as to the condition of the skin of the rats at the site of application.

*Characteristic odor.*—A characteristic odor was encountered on opening the bodies of all animals in these experiments. The odor resembled that of putrid mushrooms, and if once detected it is very easy to remember. The odor is not that of ethylene dibromide.

*Lungs.*—The lungs appeared congested in all cases, and many were edematous in the guinea pigs exposed to inhalation of the vapors. In one case a small amount of clear fluid was present in the pleural cavity. The sections disclosed varying degrees of congestion and swelling of the alveolar walls. The epithelial lining of the bronchioles was degenerated and disintegrated. Edema was present in many cases, and in the milder cases it was confined to the regions about the blood vessels.

*Heart.*—The heart was either contracted or relaxed, but in no case was it distended. The muscle appeared pale and slightly edematous. The sections showed a slight degree of interstitial edema, and the muscles appeared more or less granular with the cross striations staining palely.

*Liver.*—The liver was usually congested, edematous, and showed cloudy swelling. In a few cases the liver was pale. Microscopically, the sinusoids were markedly congested and their walls edematous, and the cytoplasm of the liver cells was in a granular condition.

*Pancreas.*—Gross pathologic changes of the pancreas were not noted in any of the animals. In the microscopic preparations there was a general interstitial edema present in all cases. The acinar cells were frequently found somewhat atrophied and were deficient in their basophilic staining properties. In nearly all cases zymogen granules were absent, and if present they were not discrete but appeared to be more or less fused. The pancreatic duct was filled with a finely granular staining fluid. The islet cells of Langerhans were degenerated, and some were disintegrated.

*Spleen.*—The gross appearances of the spleens of the inhalation animals and of those of the skin-absorption animals were different in that the former appeared pale and edematous, while the latter were highly congested and edematous. The microscopic picture in the case of the inhalation guinea pigs was that of an intense edema present both in the nodules and in the pulp. Occasionally a congested area was noted in which many red cells were laked. The sinusoidal endothelial cells were swollen; many of them were free in the pulp, showing but little phagocytosis. Both the sinusoidal and lymphoidal cells were degenerated.

*Kidneys.*—In the gross the kidneys were pale gray, but this was confined to the cortex and outer medulla, as revealed on sectioning. Cloudy swelling and degeneration of the cortex were noted. Microscopically, the most prominent changes occurred in the convoluted tubules and in the ascending limb of Henle, and particularly in the proximal convoluted tubules, a large portion of which were markedly degenerated and disintegrating, as shown in Plate I. The cells of the remaining portion, excepting the collecting tubules and the ducts of Bellini, showed varying degrees of granular degeneration. The

endothelial cells of the capillaries of the glomeruli were swollen and degenerated, and as a whole but little blood was present in the tufts. Serous exudate was frequently present in the capsular space, and occasionally hemorrhage.

*Suprarenals.*—As a rule the suprarenal glands in their gross appearance were found to be pale and slightly degenerated, but in a few cases they were congested and slightly hemorrhagic.

#### PHYSICAL SIGNS

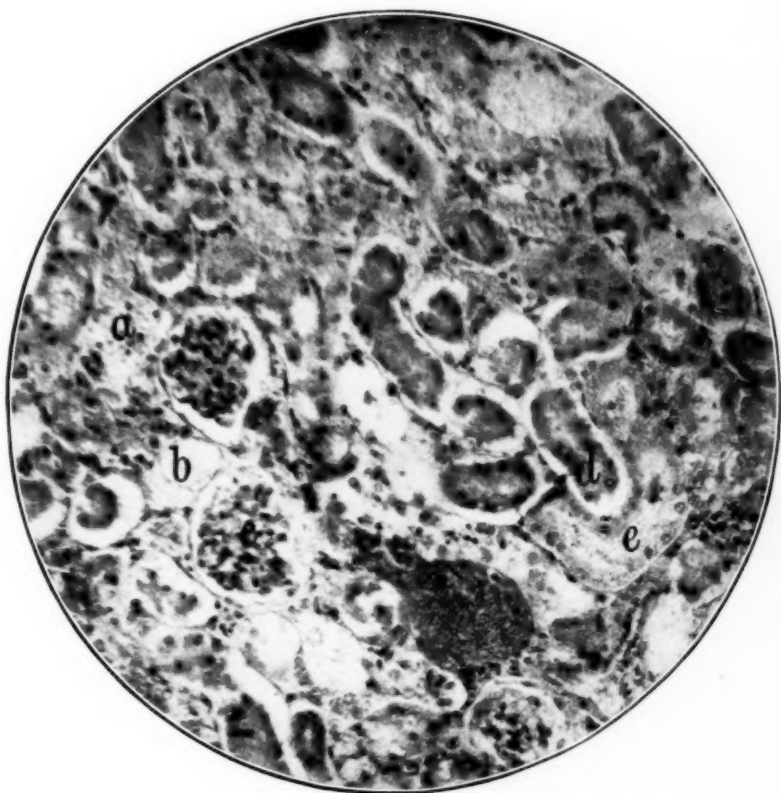
The ethylene dibromide vapors gave evidence of a nasal irritation in the guinea pigs, and the animals gradually became weaker. No evidence of myoclonic contractions were noted in these animals. In the experiments in which the material was applied on the abdomen the fluid produced a marked hyperemia of the small cutaneous blood vessels and the abdominal muscles became contracted and remained tense. In 20 minutes the reflexes became weak and the animal was scarcely able to stand erect; 10 minutes later the animals showed a slightly increased activity, which, however, was only temporary. The general appearance was that of great weakness.

#### COMMENTS ON FINDINGS

No attempts were made to establish the lethal dose of ethylene dibromide either by inhalation or by skin absorption. When these results were compared with those obtained by the authors in a few experiments on lead tetraethyl it appeared that the two compounds were of nearly equal toxicity. Ethylene dibromide, however, is not an accumulative type of poison and, hence, does not present as great a health problem as lead tetraethyl. Its hazards as regards its use in ethyl gasoline are mainly in the manufacture of the ethylene dibromide.

The action of ethylene dibromide was that of a general poison when judged by the pathologic findings. It attacked the specialized parenchymal cells of the various organs and the vascular system. The pathology of the former was that of a granular degeneration, most pronounced in many loops of the proximal convoluted tubules of the kidney, which had frequently advanced to nearly complete disintegration. The changes in the vascular system were a swelling and degeneration of the endothelial lining, which was particularly prominent in the splenic sinusoids and in the glomerular tufts. The alteration in the vascular system was manifested by the edema which occurred throughout the different organs.

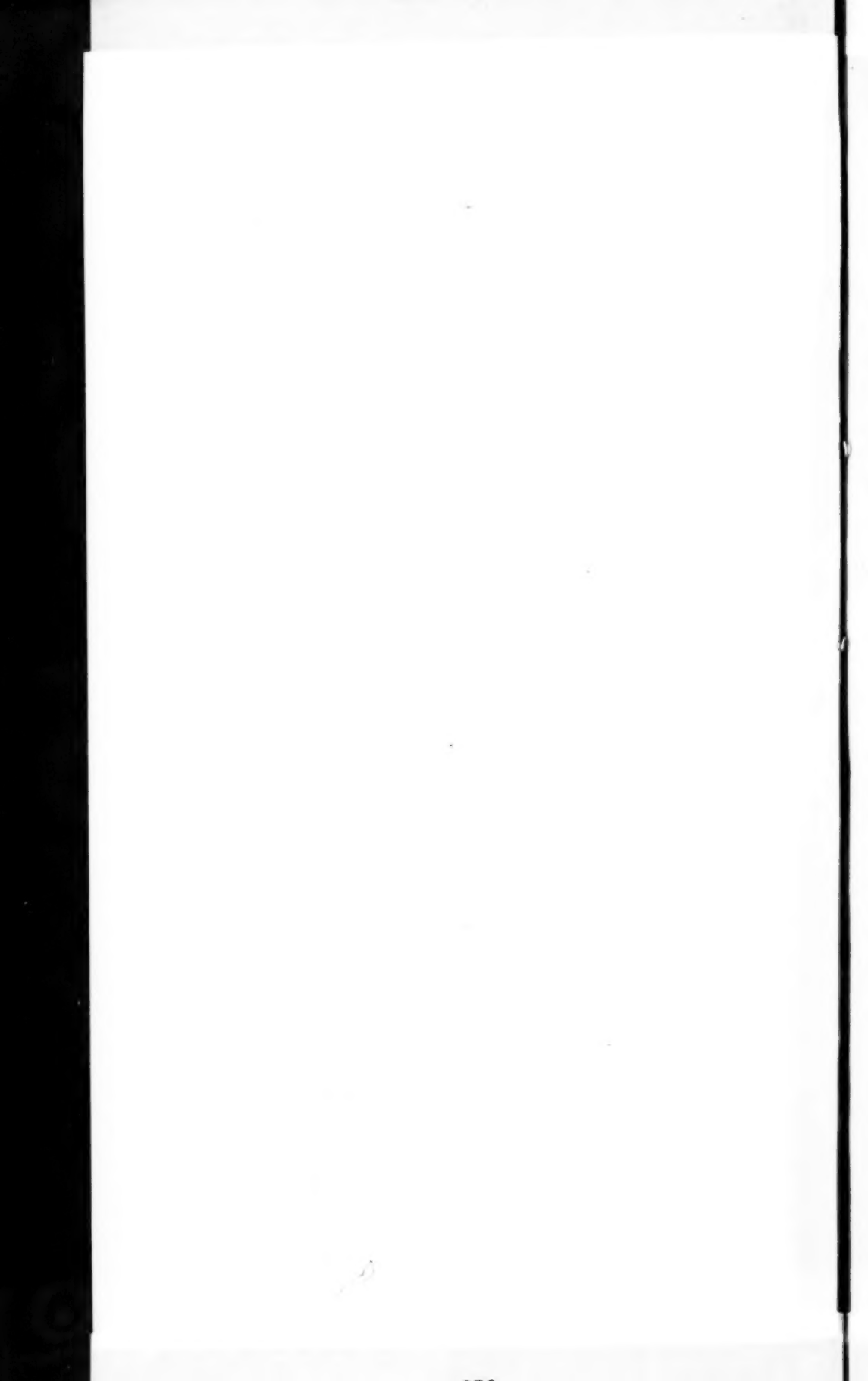
These experiments indicate that ethylene dibromide is a distinct industrial health hazard, and can be detected by its odor and irritation of the skin and mucous membranes.



Kidney section of guinea pig exposed to ethylene dibromide vapors. (X 190)

- (a) Disintegrating tubule
- (b) Site of destroyed tubule filled with serous exudate
- (c) Endothelial cells of glomerular tufts swollen, and serous exudate present in the glomerular space
- (d) Cells of the proximal convoluted tubule detached from basal membrane in early stage of degeneration
- (e) Lumen of proximal convoluted tubule filled with serous exudate





## CONCLUSIONS

1. The vapors of ethylene dibromide are highly toxic for guinea pigs; 0.4 per cent inhaled for 1 hour produced death within 6 to 18 hours. The minimum lethal dose was not determined.

2. Ethylene dibromide applied on the skin is highly toxic for rats; 0.25 cubic centimeters applied on the abdomen produces death within 6 to 18 hours. The minimum lethal dose was not determined.

3. Animals that die as the result of acute ethylene dibromide poisoning have a pathognomonic putrid mushroom odor at autopsy.

4. Ethylene dibromide is a general poison that produces a granular degeneration of the parenchymal tissue of the kidneys, liver, suprarenals, pancreas, spleen, and heart, and produces a swelling and degeneration of the endothelial lining of the vascular system, with a tendency toward a generalized interstitial edema.

5. The most pronounced lesion noted was that of a marked granular degeneration and disintegration of many loops of the convoluted tubules of the kidney.

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## SOME SPECIAL FEATURES OF THE WORK OF THE PUBLIC HEALTH SERVICE

*(Concluding articles of this series, the first of which appeared in the preceding issue of Public Health Reports)*

### TETRAETHYL LEAD INVESTIGATION

Everyone who has driven an automobile knows that a knock in the motor is something the average motorist wishes to avoid at all costs. Consequently, all motorists are interested in any method of preventing knocks. And thus it happened that, in 1923, when a new preparation known as ethyl gasoline was introduced to the motoring world, the event created widespread interest because it was advertised that this gasoline reduced motor knocks.

Ethyl gasoline is made by the addition of tetraethyl lead to ordinary gasoline. Tetraethyl lead, or lead tetraethyl, is a compound formed of one lead atom and four ethyl, or  $C_2H_5$ , groups; its formula is therefore  $Pb(C_2H_5)_4$ . A red dye and some other substances are put in the gasoline together with the tetraethyl lead.

The compound has been the subject of research work, particularly on the part of the General Motors Co. These investigations had demonstrated that the use of tetraethyl lead in gasoline brought about a change in the explosive characteristics of the gasoline somewhat similar to the change occurring when black powder is replaced by smokeless powder. Just as the smokeless powder gives a push to the projectile all the way to the end of the barrel, so tetraethyl lead gasoline, by reason of its comparatively slow explosive character,

gives a more constant pressure on the piston head in the power stroke. Both the motor industry and the gasoline producers were interested in this possible increased power and mileage, as well as in the conservation of the available supply of petroleum.

But this is only one side of the picture. Lead is probably the second most frequent cause of poisoning to-day. It ranks next to carbon monoxide, which is dangerous chiefly, if not entirely, on account of acute poisoning which may be rapidly fatal.

Poisoning from lead is slower and more insidious; and danger from this new distribution of lead was at once apprehended by those who had specialized in preventing risks of this sort. Furthermore, it was soon found that pure tetraethyl lead itself is an extremely dangerous and treacherous compound. Fatal cases of poisoning began to occur in its manufacture and handling; and there can be little doubt that as long as tetraethyl lead is made, there will be some perils attending the use of the pure undiluted substance.

But it was not tetraethyl lead that was being sold to motorists; it was gasoline containing a small amount of "ethyl fluid," which, in turn, contained some tetraethyl lead. On account of the complexity and uncertainty of this problem—that is, the possible danger from the use of the dilute ethyl gasoline—the Surgeon General called a conference in May, 1925, as a result of which an investigation was carried out under the auspices of a committee of seven recognized authorities (Doctors Chesley and Leathers, and Professors Edsall, Howell, Hunt, Stieglitz, and Winslow) to solve the question which presented itself before every health officer as to whether the use of this gasoline should be permitted. A report was called for by January, 1926.

The investigation which followed demonstrated in a striking manner the value of a disciplined corps such as the Public Health Service. For the various phases of the work the services of chemists, physicians, statisticians, and specialists in other branches of science were required, and the Public Health Service was able to mobilize a force containing all of these men.

It would have cost well over \$100,000 to conduct the investigation had it been necessary to employ all of these various experts for this particular occasion. As it was, the total cost was about \$12,000.

To some extent the investigation was hampered by the fact that the Ethyl Gasoline Corporation had withdrawn its product from the market voluntarily, even before the conference was called. This action was of course salutary in the then uncertain status of the question, but it also tended to restrict the field investigation to one territory in southwestern Ohio, where the local distributing oil company had sufficient stock to continue to supply its trade despite the suspension by the Ethyl Gasoline Corporation. Fortunately, how-

ever, this was the very territory in which ethyl gasoline had longest been used; and through remarkable cooperation in this region examinations were possible of the various groups required to settle the point at issue.

In all, the investigators studied more than 250 individuals, divided into groups according to their exposure. The first group comprised men exposed to exhaust gases from ordinary gasoline, the second group those exposed to exhaust gases from ethyl gasoline, exposure in both cases being greater in degree than that of the ordinary motoring public; the third group were garage workers and gasoline handlers, not exposed to tetraethyl lead gasoline, and the fourth group, garage workers and gasoline handlers exposed to tetraethyl lead gasoline, not only in the intense concentration of exhaust gases in closed garages, but also in the spilling of leaded gasoline on their hands and clothing and in inhaling the evaporated fumes from repeated spillage on the floor.

Thus the second and fourth groups with ethyl gasoline exposure could be compared accurately with the similar first and third groups respectively, who were not exposed to ethyl gasoline. There was also a fifth group of men exposed to a definite danger from lead but still able to work. This group was studied in order to determine whether the methods used in the investigation would detect the slight amount of lead absorption or injury which was being looked for.

On the basis of the investigation the committee presented its conclusions, which were as follows:

1. Drivers of cars using ethyl gasoline as a fuel and in which the concentration of tetraethyl lead was not greater than 1 part to 1,300 parts by volume of gasoline, showed no definite signs of having absorbed lead after exposures approximating two years.

2. Employees of garages engaged in the handling and repairing of automobiles and employees of automobile service stations may show evidence of lead absorption.

In garages and stations in which ethyl gasoline was used, the amount of apparent absorption was somewhat greater than in those without ethyl gasoline; but the effect was slight in comparison with that shown by workers in other industries when there was definite danger from lead (the fifth group), and for the periods of exposures studied was not sufficient to produce lead poisoning.

3. In the regions in which ethyl gasoline has been used to the greatest extent as a motor fuel for a period of between two and three years, no definite cases have been discovered of recognizable lead poisoning or other disease resulting from the use of ethyl gasoline.

In view of these conclusions the committee reported that in their opinion there were no good grounds for prohibiting the use of ethyl gasoline of the composition specified as a motor fuel, provided its distribution and use were controlled by proper regulations which were to be drawn up by the office of the Surgeon General. The

committee also recommended that the investigation be continued, in view of the possibility that results which had not been apparent at the time of the investigation might develop after the use of ethyl gasoline for a more extended period.

Regulations have been drafted for adoption by the various States—since the control of such matters rests in the police powers of the States, not in the Federal Government. These regulations concern the manufacture and mixing of tetraethyl lead and the distribution of the gasoline. They have been followed by the companies concerned and thus far have proved entirely successful in the prevention of poisoning.

A further set of regulations deals with the broader field of automobile garages in general, repair shops, and filling stations. This set of regulations is aimed particularly at the much greater danger of carbon monoxide poisoning, as well as at the possible risk from leaded gasoline. Briefly these regulations provide that garages, etc., should have at least as effective ventilation as is provided by permanently open ventilators at ceiling level, free to the outside air, but protected from down drafts, with a cross-section area of two one-thousandths of the floor space available for automobiles, together with inlet openings near the floor level of corresponding size.

It is also provided that garages be kept clean by flushing out or moist sweeping, for one of the startling results of the investigation was the finding that there is a considerable quantity of lead present in the dust of ordinary garages, even where no leaded gasoline has been used. The regulations further provide that the following warning be displayed in the garages:

"Automobile exhaust gas is dangerous. Motors should not run longer than 30 seconds unless the car is in motion or the exhaust is directly connected to the outside air. Liquids sold as motor fuel, except ordinary gasoline, should be used only as motor fuel, and not for cleaning or other purposes. The fumes from the evaporation of even ordinary gasoline may be injurious."

#### MILK-BORNE DISEASES

Milk occupies rather a unique position among our articles of diet in that it is produced in nature solely for the purpose of serving as a food. It is especially adapted to the needs of the young and growing individual, but has been found highly beneficial to adults—the vigorous, the ill, and the aged.

Milk, however, is an excellent medium for the multiplication of many kinds of bacteria, including a number of those which produce disease in man. It is, therefore, imperative that milk be safeguarded against contamination with disease germs (sanitation), that it be so handled as to prevent their multiplication should they accidentally gain an



entrance (cooling), and, most important of all, that it be submitted to some process which will kill disease germs without materially altering the flavor and food value of the milk (Pasteurization).

Outbreaks of disease due to contaminated milk have probably occurred from time to time since man began to use the milk of animals for food, but records of these outbreaks are available for only a few years.

Various writers have collected records of 179 milk-borne outbreaks in the United States from 1881 to 1908. Dr. Charles Armstrong and Dr. Thomas Parran, jr., have compiled data on 574 additional outbreaks for the United States which were traced to milk from 1908 to 1926—a total of 753 recorded outbreaks from 1881 to 1926.

The number of recorded outbreaks by five-year periods shows a steady increase from 1880 up to the period 1911–1914, inclusive. The maximum number for any one year was 55 in 1914. Obviously these figures are not complete, as many milk-borne outbreaks have probably gone unidentified, while others have not been recorded; and, of those recorded, it is quite probable that not all have been located.

The compilations made do not include cases of bovine tuberculosis which occur sporadically, or scattered cases of infantile diarrhea which are, at least in part, due to improperly produced or improperly handled milk. Therefore, the figures mentioned must be considered a minimal estimation of milk as a disease carrier; but they serve as a cross section of the situation over a considerable period.

Protection of the milk supply, except in instances in which interstate quarantine may operate to prevent spread of a disease, is entirely a matter under the control of the State and local health authorities.

The Bureau of the Public Health Service is, however, vitally interested in the question; and through previous investigations, and through studies now under way, the service has been instrumental in pointing out certain important defects in pasteurization equipment and in bringing about improvements which will eliminate such objectionable features. The Public Health Service also has evolved a "model" milk ordinance which has been adopted by many States and a large number of cities throughout the country.

In addition to these activities the Public Health Service endeavors to serve as a sort of clearing house for the accumulation of information relative to the occurrence of milk-borne outbreaks of disease throughout the country. Inquiries are constantly being received on subjects related to the spread of disease through contaminated milk. Then, too, State and local health officials frequently seek the advice of the Public Health Service when local problems present themselves for solution. Frequently the Public Health Service has data and information gained from a study of similar situations in

other localities and, in any event, it is always glad to confer and cooperate with the local authorities and give them the benefit of any information it possesses.

The most common milk-borne outbreak in the United States during the past 18 years has been typhoid fever, of which reports of 449 instances with more than 14,000 cases have been collected. Four hundred and twenty of these outbreaks were attributable to milk, 26 to ice cream, 2 to butter, and 1 to cheese. In 20 instances the milk was said to have been pasteurized.

While typhoid fever led all other milk-borne diseases in the number of recorded outbreaks and in the number of persons actually affected during the past 18 years, it is probably second to septic sore throat, of which 35 outbreaks were recorded with an estimate of more than 20,000 cases.

There have been 40 recorded milk-borne outbreaks of scarlet fever in the past 18 years. These, like those of septic sore throat, have all been in the northern United States, the most southern being in southeastern Ohio. In two instances outbreaks were traced to pasteurized milk and in one instance to ice cream.

Records of 25 outbreaks of diphtheria were collected—one traced to pasteurized milk, one to certified milk, one to ice cream, and one to butter. These outbreaks were chiefly in the northern part of the United States, although there was one reported from Charlottesville, Va., and another from Austin, Tex.

Among other milk-borne outbreaks there may be mentioned 7 of paratyphoid fever, 8 of dysentery or diarrhea, 1 each of appendicitis, parotitis, poliomyelitis, and denguelike syndrome, 1 of Malta fever traced to goat's milk, and 1 of botulism traced to cheese.

Reports on 28 of the outbreaks attributed them to "pasteurized" supplies, but in 11 of the 28 instances there was evidence to indicate infection subsequent to pasteurization. In 3 outbreaks a possible substitution of raw for pasteurized milk could not be ruled out. In 3 instances there was evidence that the heating had not been to the specified degree; in 2 instances the so-called pasteurization consisted of heating the milk in a starter can; 1 of the reports stated that the equipment for pasteurization was obviously faulty; while in the remaining 8 outbreaks, 1 followed the flash method and in the others either the method of pasteurization or the source of infection was not stated.

It is apparent that these reported outbreaks do not constitute an indictment against what is usually considered adequate pasteurization in this country. They do, however, indicate the necessity for proper care in the construction of pasteurization equipment, in its operation, and in the protection of milk from infection subsequent to its pasteurization. The magnitude of the problem will be realized

when it is recalled that more than 7,000,000,000 gallons of milk are produced annually in the United States.

### NUTRITIONAL DISEASES

The work of the Public Health Service on nutritional diseases of man has concerned itself mainly with pellagra. Indeed, it may be said that the work on nutritional diseases grew out of the study of pellagra, for in the beginning of that study it was not known that pellagra is a disease attributable to a faulty diet.

Pellagra has been known for nearly 200 years. At one time or another it has been particularly prevalent in Spain, northern Italy, Egypt, and the Balkan countries, where up to a few years ago, it was believed to be practically incurable and that it led inevitably to insanity and death. It was not known to occur in the United States until about 1908 or 1909. This discovery created considerable apprehension, particularly among physicians and sanitarians. The then Surgeon General of the Public Health Service, Dr. Walter Wyman, at once recognized the importance of the problem and assigned Dr. Claude H. Lavinder, an officer of the Public Health Service, to study the disease. Since then a number of other medical officers, statisticians, and sanitary engineers have for varying periods carried on investigations of one phase or another of the disease.

Although at first thought to be restricted in its prevalence to the Southern States, it has been found that it may occur, or has occurred, in every State in the Union and in the District of Columbia—so that the problem of pellagra in the United States is a national one. Its prevalence in the United States varies from year to year so that it is difficult to estimate the numbers attacked, particularly in view of the inadequacies of morbidity and mortality reports from certain States.

However, it is highly probable that in 1917, for example, there were fully 125,000 cases of the disease in the States south of the Potomac and Ohio Rivers alone.

When the disease was first recognized as present in the United States it was believed, following the lead of the Italian investigators, that it was due to the eating of spoiled corn; and although on the surface this theory seemed to be supported by the fact that the disease was more prevalent in the South, where corn is a much more important item of food than it is in the North, it was not long before increasingly strong doubts arose as to the validity of this theory.

In its place there began to arise an idea that the disease was an infection, particularly as such an idea had been strongly suggested by a distinguished British investigator who expressed the opinion that, like malaria, pellagra was due to the bite of an insect, in this case a Buffalo gnat.

The Public Health Service investigators took cognizance of these opposing theories when they began their studies, but the facts developed by them failed to support either of these views; they have been able to prove, instead, that the disease is due to a faulty diet, the primary fault being a deficiency in a food essential, probably of the nature of a vitamin, which has been provisionally named vitamin P-P (pellagra-preventive).

The Public Health Service investigations have resulted in showing also that this pellagra-preventing vitamin is one of at least two vitamins that were theretofore included under the term vitamin B. The research on pellagra has therefore resulted not only in determining the primary essential cause of pellagra, but in clarifying our knowledge of the cause of another nutritional disease, particularly common in the Orient, known as beriberi; for this disease is due to a deficiency of the second one of the factors heretofore included under the term vitamin B.

As the knowledge of the nature of pellagra resulting from these researches progressed, each advance was published, together with recommendations for the treatment and prevention of the disease. Once it was clear that the disease was due to a dietary fault, it was obvious that the remedy lay in a proper diet and this was early recommended and ever since has been persistently advocated.

The Public Health Service has cooperated and cooperates with State and local health officials and private agencies in carrying on a campaign of education designed to bring about a better knowledge of a healthful diet with the view of preventing not only pellagra but other possibly more obscure nutritional disturbances and thus of improving the health of the people.

This, even more than most campaigns for the improvement of the public health, is beset by difficulties arising from the fact that economic considerations play a most potent part in bringing about the conditions that favor faulty diet and disease resulting therefrom. Moreover, our knowledge of the subject is not as yet sufficiently detailed to permit of much more than general recommendations.

Thus our knowledge of the distribution of the pellagra-preventing vitamin in our foodstuffs is only in its beginning. The investigations at present in progress are designed in a large measure to correct this defect in our knowledge.

It is believed that extensive laboratory investigations now under way will before long supply much of the needed knowledge with regard to food values.

#### ANIMAL DISEASES

The division of zoology of the Hygienic Laboratory is not a place where rare and ferocious animals are exhibited in cages for the amusement of onlookers. In fact, the only animals ordinarily in custody



of the division are preserved specimens. So far as material equipment goes, the division consists of a rather unpretentious laboratory, and an imposing collection of card-index files and books dealing with subjects in the field over which the division has jurisdiction.

Speaking of the field in which the division of zoology operates, recalls that the limits of that field are as hazy from an administrative standpoint as they are in nature. It is easy enough to say that the division is concerned with all zoological questions involving public health or diseases of man. But Nature herself has drawn no distinct line to determine where zoology ends and botany begins, and, likewise, there are many zoological questions which involve the health of both man and the lower animals and the line of demarcation is not always clear.

Indeed, it is very common to find that man and the lower animals present different phases in the life cycle of one disease. Theoretically, this division is expected to concern itself exclusively with questions involving human health, while the division of zoology in the Bureau of Animal Industry, Department of Agriculture, deals with similar problems affecting domesticated animals.

In practice, the work of the two divisions dovetails to a remarkable degree, although it is well recognized that it would be impracticable both from an administrative and a scientific viewpoint to consolidate the two units. It may be noted in passing that Congress provided for the Division of Zoology in the Department of Agriculture several years before it established this division in the Public Health Service.

When the Surgeon General of the Public Health Service requires information on some question involving zoology he calls upon this division. It is his information bureau in that field. It also acts as a clearing house for information for State boards of health, city health officials, and others interested.

One of the most important duties of the division is keeping up with the world's literature on medical zoology. A part of its activities toward that end was the preparation of an authors' catalogue which lists every known publication in every language in print at the time the catalogue was issued. This work is kept up to date by a card-index system. The authors' catalogue was prepared in cooperation with the division of zoology of the Department of Agriculture, and that department published the completed volume.

Supplementing the authors' catalogue there is a cross-reference subject catalogue and a host catalogue of the diseases of man and the domesticated and wild animals. The latter publications were prepared by the two divisions of zoology in cooperation and are published by the Public Health Service.

It is this elaborate system of catalogues which makes it possible occasionally to perform apparent miracles in the way of furnishing



information. There was an occasion in which a Cabinet officer sent in a request for the number of cases of trichinosis in Germany caused by eating American pork. The request was accompanied by the statement that the Secretary realized there would be a vast amount of research work involved and that it probably would require at least six months to get an answer.

Thanks to the proper indexing and cataloguing, it was possible to supply the information required in less than an hour after the request was received.

During the World War the entire division of zoology was called into service in connection with the sanitation problems created by the establishments of the large cantonments. A difference of opinion as to how far infection can travel underground and infect wells developed in connection with this work and as a result an inter-departmental and interuniversity board was appointed to make an investigation. The chief of the division of zoology of the Hygienic Laboratory was appointed chairman of this board.

The investigation began in 1919 and has just been completed. Prior to this investigation other workers had shown experimentally that infection could travel underground for about 10 feet laterally. The investigation by this board has demonstrated that chemicals placed in the ground can be detected 450 feet away, and disease germs were recovered in wells 232 feet away from the spot at which they were placed in the ground.

Governmental economy halted the investigation when these facts had been ascertained, but there was no evidence to indicate that the limit of transmission of infection in this manner had been reached. The experiments were carried on in a region where the underground water flow was only about 1 foot per day, while in other sections it is known that the rate of flow reaches a maximum of about 400 feet per day, indicating that infection would spread much more rapidly than it did in the area where the experiments were conducted.

The investigations also determined that it is the rise and fall of the underground water level in rainy or dry weather which filters out and eventually kills certain germs of disease. If it were not for this fluctuation of levels it would be practically impossible to find a well that was not infected, except, of course, certain deep wells. Professor Weinger, of the United States Geological Survey, cooperated in the ground water studies.

Immediately after the World War the division of zoology conducted an investigation which set at rest fears that amebic dysentery would be spread through the country by the returning soldiers. It was found that the percentage of returned soldiers carrying this infection was not higher than the percentage of those who had not been abroad.

The chief of the division of zoology, Prof. Ch. Wardell Stiles, is one of the two American governmental representatives on the International Commission for Zoological Nomenclature, the other official representative being Dr. L. Stejneger, of the National Museum, while Prof. David Starr Jordan, of California, is a nongovernmental American representative. This international commission of 18 members prescribes the regulations for naming animals, including the parasites which are the chief object of attention by the medical zoologist. The commission will hold its next triennial meeting in Budapest in August, 1927. Professor Stiles has been secretary of the commission since 1897, and for that reason the files and records of the commission are kept in the Hygienic Laboratory at Washington.

Most research work in medical zoology deals with parasites which cause diseases in man or other animals. It is not only the domesticated animals, the rodents such as rats, ground squirrels, and animals of the type which come in close contact with man that form a danger. There are diseases in the rhinoceros which may be transmitted to man, and there are diseases in fishes which frequently are transmitted. Even the snakes, crabs, and snails have parasitic diseases which sometimes find their way to man.

A study of the life cycle of the disease organism frequently leads to an investigation of sanitary conditions. This was the case in the hookworm investigation instituted by this division in which it was disclosed that about 50 per cent of the farms, and a very high percentage of rural schools and churches in the South, were without sanitary toilet facilities. It was, in fact, the studies of this division which interested Walter Hines Page in hookworm disease, and which eventually resulted in the financial support by Mr. Rockefeller of the hookworm campaign in the Southern States, a campaign which resulted in the present intensified public-health work in the South, and eventually was followed by the formation of the International Health Board.

The staff of the division of zoology of the Hygienic Laboratory at present consists of the chief of the division, 4 assistants, and 1 messenger. This is the normal staff, although during special investigations as many as 25 assistants have been employed. The assistants in this division are all college graduates who have command of at least two languages besides English, and who have a satisfactory knowledge of the fundamentals of zoology. The division as a whole does work in about 12 languages. It has been found that a reading knowledge of Latin is indispensable for workers in this division. All of the assistants are chosen under civil service regulations.

The division is prepared to answer inquiries on the following subjects: Diagnosis, treatment, and prevention of parasitic diseases; technical questions in zoological nomenclature; public-health questions dependent upon zoology.

### MILK SUPPLIES

Milk sanitation became a definite part of the work of the Public Health Service with the beginning of cooperative milk control work with the Alabama State Board of Health in 1922. Most of the communities in that State had extremely unsatisfactory and potentially dangerous milk supplies, a condition true of most parts of the country.

The work first centered around an attempt to make milk-control methods uniform throughout the State by the introduction and enforcement of a standard milk ordinance which had been prepared by the Public Health Service. The work further involved a periodic determination of the sanitary milk ratings of communities so as to encourage effective enforcement.

Thus far the ordinance has been adopted in 17 Alabama communities, 14 of which have operated under it long enough to secure outstanding results, among which are a 142 per cent improvement in milk sanitation and a 90 per cent increase in the sales of market milk. Attention of other cities and States was attracted by the success of the milk work in Alabama and the demand for information became widespread.

Accordingly, the milk ordinance gradually became known as the United States Public Health Service Standard Milk Ordinance. The first steps toward a national unification program were taken in 1923, when the State of North Carolina adopted the standard milk ordinance. Since that time 13 States and 117 cities have adopted the ordinance, and surveys to determine the sanitary status of the milk supply have been carried on in over 150 communities. The States which have adopted the standard milk ordinance are, in their order of adoption, as follows: Alabama, North Carolina, Texas, Virginia, Tennessee, South Carolina, Missouri, Kentucky, Arkansas, Louisiana, Utah, Mississippi, West Virginia. Several other States are contemplating a future adoption of the ordinance as funds and personnel permit.

The present program is divided into several parts, as follows:

- (1) Unification of milk control in the United States.
  - (a) Study of the state-wide milk sanitation problem.
  - (b) Encouragement of States to adopt one standard program subject to amendment by majority vote at periodic State conferences.
  - (c) Advisory assistance to States.
- (2) Periodic measurement of progress of milk sanitation in the United States.
  - (a) Studies of methods of measuring the milk sanitation status of cities.
  - (b) Periodic determination of milk sanitation ratings of cities.

(3) Special investigations.

- (a) Milk-borne disease prevalence.
- (b) Design and operation of pasteurizing machinery.
- (c) Sterilization of milk utensils and equipment.
- (d) Refrigeration.
- (e) Miscellaneous.

The Public Health Service unification program includes the following two elements of relationship between the cities and States and the Public Health Service.

(1) The State is advised, upon its adoption of the Public Health Service program, to have one of its milk-control officials visit each standard ordinance city in the State at least once during each grading period, and check the accuracy and uniformity of the inspection and the laboratory and grading methods. This should give the assurance to the city officials and to the dairy industry that uniform enforcement methods are being followed throughout the State.

(2) A Public Health Service officer is detailed to each State operating under the program each year for a period long enough to coordinate the State's interpretation of the standard ordinance with that of the other States, and to determine jointly with the State the milk sanitation ratings of the various cities operating under the standard ordinance.

This plan is one which gives the maximum assurance of continued uniform enforcement of the standard ordinance, and which gives a scientific measure once each year of the relative progress made by the various cities operating under the ordinance.

Application of the Public Health Service standard program has brought about certain changes which have been observed as follows:

The enforcement of the ordinance has been followed by an improvement in milk sanitation, and an increase in the volume of market milk sales.

It has elicited the support of the dairy industry.

It has been enacted and enforced by many different types of cities and has successfully met rigid tests and criticisms.

In a large number of the cities now operating under the standard milk ordinance the passage of the ordinance was urged by the dairy industry itself.

This last fact has been one of the most gratifying features of the work. The support which has been accorded the present program by the dairy industry is accepted as evidence that that industry is progressive and is mindful of its responsibility for the health of its patrons. Indorsement of the program has been given by the dairy industry and by one of the largest life insurance companies.

On May 25, 1926, the standard milk ordinance of the United States Public Health Service, slightly modified, was adopted as a

standard for the United States by the Conference of State and Territorial Health Officers.

On November 17, 1926, the public health section of the Southern Medical Association, at its annual meeting in Atlanta, Ga., adopted a resolution to petition Congress for a special appropriation for the promotion of the milk sanitation program throughout the United States.

The Public Health Service is now engaged in carrying on some special investigations supplementing the activities associated directly with the proper enforcement of the standard milk ordinance as follows:

(1) Milk-borne disease prevalence.

In 1924 a questionnaire survey was made of milk-borne outbreaks occurring in the registration cities of the United States during the six-year period 1918 to 1923, inclusive. In 1925 a questionnaire survey was made of milk-borne outbreaks occurring in 1924. These surveys showed that between 40 and 50 outbreaks of milk-borne diseases are occurring each year in the United States. It is planned to continue these surveys from year to year in an effort to secure accurate information on milk-borne disease prevalence and to urge the adoption of preventive measures by health officials and dairymen.

(2) Design and operation of pasteurizing machinery.

The United States Public Health Service believes that pasteurization of milk is the most potent single force operating to prevent the transmission of milk-borne disease. It is further believed, however, that certain corrections should be made in the design and operation of pasteurization apparatus and machinery so that it may more nearly accomplish efficient pasteurization of all milk which enters it.

It is also believed that greater uniformity in the definition of pasteurization is advisable. A study of present-day definitions in numerous milk ordinances revealed the fact that some of them, if actually enforced as intended, do not insure uniformly effective milk pasteurization. Some of them, though theoretically effective, can not be effectively enforced without more information than is at present available to local health officers. Other definitions of pasteurization, if strictly enforced as intended, will partly or completely destroy the creaming ability of the milk. This fact has a commercial aspect which is recognized by milk dealers.

The Public Health Service is at present engaged in a detailed study of the design and operation of milk pasteurization apparatus and machinery and of temperature control and recording devices. The object of the study is to secure basic facts which may assist milk-control officials in their efforts to formulate proper definitions and



specifications with the eventual result that pasteurization methods will be improved.

The plan of work embraces factors which might affect the actual temperature of all milk entering or leaving or held in different types of pasteurizing apparatus. Among such factors which are to be studied are "cold pockets," foaming, valve leakage, agitation, and insulation. The plan of work also includes a study of the installation and operation of temperature indicating, recording, and control devices.

In the testing work, temperatures are being determined electrically by means of the thermocouple and potentiometer principles. This has many advantages over the ordinary thermometer method. The interest which has been manifested in these studies indicates its importance to equipment manufacturers and to milk-control officials.

The testing work on pasteurizing apparatus and machinery thus far done by the United States Public Health Service has disclosed many defective types of apparatus. It has also disclosed the fact that certain makes of apparatus are properly designed. As a result of the testing work many makers of apparatus have instituted changes in design and installation, and corrections have been made in apparatus already installed.

#### SALT-MARSH MOSQUITOES

Man's progress in civilization may be said to be measured by his successful battles with other forms of life.

In the beginning it was the larger animals that he feared—the prehistoric monsters which could crush him and devour him. But on the day when an early cave man first grasped a rude club to beat off some animal rival for his food, there began a procession of events which sealed the doom of the monsters. As man utilized his mental prowess to develop weapons of ever-increasing efficiency, as he progressed from club to spear, to bow and arrow, to crossbow, to primitive firearms, to modern repeating rifles with high-explosive shells, the larger animals faded from the picture.

To-day, so far as civilized man is concerned, they are mere adjuncts to his recreation—something to be hunted in his leisure time. But it has long been recognized that when man conquered the huge carnivorous animals he had only just begun his battle with the nonhuman forms of life on earth. He must battle also with the insects and with those microscopic organisms known as bacteria.

And, among the insects, there can be little doubt that one of man's worst enemies is the mosquito.

Large areas of the coastal sections of the South Atlantic and Gulf States have repeatedly been rendered uninhabitable by hordes of buzzing, biting mosquitoes that build their homes and raise their

broods in the salt marshes. So far as is known, most of these mosquitoes do not carry diseases and, hence, they have not received the attention which has been bestowed upon the *Anopheles* and the *Aedes*, purveyors, respectively, of malaria and of yellow and dengue fever.

The summer and fall of 1925 brought a tremendous influx of the salt-marsh mosquitoes to the doors of residents, to industries, and to developmental activities. Never before had the insect pests been so numerous or annoying. The normal activities of man in the affected areas had to be subordinated to fighting the mosquitoes; and it seemed that, in some communities, the very wheels of Government would cease to revolve because every one was occupied with the hordes of buzzing pests.

Congress recognized the problem of the salt-marsh mosquito as one involving the general welfare of the people and made an appropriation of \$25,000 becoming available in July, 1926, to make a "preliminary survey of the salt-marsh areas of the South Atlantic and Gulf States to determine the exact character of the breeding places of the salt-marsh mosquito, in order that a definite idea may be formed as to the best methods of controlling the breeding of such mosquitoes." It was specified that the work be done by the Public Health Service with the cooperation of the Bureau of Entomology of the Department of Agriculture.

After a brief reconnaissance survey, headquarters for this work were established in the Federal Building, Biloxi, Miss. An office and laboratory were soon in operating order and experienced assistants were transferred to this work. From this station a study in minute detail is being made of breeding, flight, and other habits of the salt-marsh mosquitoes. The work is being carried on the year round so that information applicable to all seasons of the year may be made available.

It was a happy choice by which Biloxi was selected as the headquarters of the survey, for in that city is located base 15 of the United States Coast Guard, which has rendered valuable assistance in reaching the outlying islands and the extensive marsh areas along the Gulf Coast. Health authorities, civic organizations, State and local chambers of commerce, county and municipal officials in many sections also have proffered their cooperation. Already in the course of the research, much valuable information has been obtained concerning mosquitoes of the malaria-bearing family. These results in themselves would justify the survey.

Although there are millions of acres of salt marshes in the South Atlantic and Gulf States, the Public Health Service does not feel that the task it has undertaken is a hopeless one. To begin with, these marshes vary widely in character, and it has been found that

only a small proportion in many sections actually produce mosquitoes. Hence, one of the first objectives of the survey is the classification of the marshes according to tidal and other influences which have a direct bearing on mosquito development. The service hopes to obtain data on egg laying, larval (wiggle tail) and flight habits, and to be able to present a formidable program for the salt-marsh mosquito eradication when several seasons of research have been completed.

To one familiar with the various angles of a problem of this nature its solution might seem either simple or too complex for study. As an illustration, on one occasion, while discussing the various phases of the survey at a luncheon club, the officer in charge was asked why it was necessary to study the habits of the mosquito, "for," the inquisitor said, "they have only one habit that I know of, and that is biting."

Biting is no more the sole habit of mosquitoes than is eating by man. The fact is, the life cycle of the mosquito is more complex and varied than that of the highest order of animals—man himself. To permit this infinitesimal, buzzing creature to preempt and rule some of the choicest sections of the southland would be to admit defeat of man's ingenuity, science, and skill.

It is expected that new methods of control soon will be inaugurated on the basis of information gained by the survey now in progress.

#### CHILD HYGIENE

The Public Health Service has contributed to the advance in child hygiene in two ways: (1) Indirect or general sanitary measures, and (2) direct or special activities.

The activities of the Public Health Service which have had a beneficent effect on the health of children include all those which have helped to improve the general welfare. Sanitary engineering, with the production of a pure water supply, has had a most important bearing on the reduction of diarrheal diseases in children. The pioneer work of the service in that field aided materially in improving the water supply.

Trachoma investigations were begun in 1912. About 175,000 school children were examined, and it was found that 1.4 per cent had trachoma. In some schools 30 per cent of the children were afflicted. Special hospitals were established at strategic points in the heavily infected districts for the treatment of trachoma. Field clinics were held in many States and thousands of cases were treated. Instruction in care and prevention was given. The preservation and restoration of vision in children and adults was of great economic value, and the general instruction in hygiene was of great value in health protection.

The extensive program for malaria control which has been carried out by the service has had a decided beneficial effect on the health of mothers and children residing in malarial districts.

The safeguarding of milk supplies has an inestimable value in the prevention of certain diseases in infants and children. This principle is of utmost importance in a health program. In 1908 the service published "Milk and Its Relation to the Public Health," a noteworthy contribution to the health education literature. This bulletin was widely distributed and it aided materially in the adoption by State and local health officers of more adequate measures for safeguarding milk supplies. The vastness of this problem may be realized when we know that there are approximately 10,000,000 children of 5 years of age and under in the registration area of the United States and whose principal article of diet should be wholesome cow's milk.

The Public Health Service is now actively prosecuting studies, the effect of which is already shown in the very widespread effort to secure milk in larger quantities and of approved sanitary quality for the use of the public.

The service supervises and controls the manufacture of biologic products so largely used in the prevention and cure of a number of the communicable diseases of childhood. The maintenance of the potency and purity of these products is an important factor in the protection of child life. Toxin antitoxin is our most potent aid in preventing diphtheria. The use of the antitoxin in the cure of the disease has saved thousands of lives and untold suffering. The death rate for diphtheria dropped from 43.3 per 100,000 population in 1900 to 12.1 per 100,000 in 1923. The service carried out the difficult task of preparing and preserving a standard diphtheria antitoxin unit which is essential to the control and production of diphtheria antitoxin.

The identification of the American species of hookworm was made by an officer of the service and led to the control of hookworm disease, which afflicted so many thousands of children in certain parts of the country.

The special child hygiene activities of the service are carried on under the provisions of the act of August 14, 1912, vesting the Public Health Service with authority "to study and investigate the diseases of man and conditions influencing the propagation and spread thereof \* \* \* and from time to time issue information in the form of publication for the use of the public." This restricts the service activities, which may be classified under the two general headings: (1) Education and (2) research.

In the field of education the work consists, broadly, in the distribution of educational material prepared by service officers, usually



based on results of special investigations. More than 70 articles and pamphlets on child hygiene and related subjects have been published by the service.

In 1915 there were but five States with bureaus of child hygiene in operation. In 1919 there were but 15. For this reason, prior to the enactment of the Federal hygiene of maternity and infancy law, the service carried on extensive investigations in child hygiene administration in several States for the purpose of advising and assisting in the organization of child health administrative work. The results of this research work were gratifying in that these investigations were a very large factor in stimulating popular interest in and creating a demand for better health protection.

*Dried milk.*—Special studies made by the service indicated that dried milk powder of the proper kind is a safe substitute for cow's milk in those places where fresh cow's milk is not available.

*The relation of physical handicaps to the state of nutrition.*—A group of 200 children was selected from 1,500 underweight children. These children were given no other attention than the correction of physical defects. They then gained weight at a more rapid rate than the normal average.

*Mouth hygiene.*—Decayed teeth and septic mouth conditions contribute a large majority of the physical defects of school children. Mouth hygiene stands in the first rank of measures for the conservation of the health of the child. The service has studied the dental conditions of 30,000 children in 11 States with the view of evaluating the effect of dental decay and mouth sepsis on growth, development, and school progress. These investigations have stimulated the interest of communities in providing facilities for dental care of children.

*Height and weight.*—Several different standards of physical development of children are in use in this country. All of these are liable to error when applied to individual children.

The service has made careful studies of over 15,000 children to measure the value of the height-weight ratio as an index of physical fitness. The results of these studies show that the nutrition of an individual child can not be judged solely by comparing his weight with the weight given in a special table. A physical examination is necessary to judge whether or not he is properly nourished.

To attempt a more accurate measurement of physical development, special anthropometric data have been collected on 30,000 children of the third generation, native-born white children, in 21 representative cities and 19 States.

*School hygiene.*—Sanitary survey of school buildings was included in certain epidemiological studies. The physical condition of the school children was also included. The service has contributed a great deal in standardizing school medical inspection, devising forms



for recording data, improving "follow-up" service to the homes, and obtaining the interest of child and parent.

*Illumination.*—Special research studies were made in natural illumination of schoolrooms. The results and recommendations of these studies were published in Public Health Bulletin No. 159.

*Health education.*—A special bulletin was prepared on the program of the several States in health education as given in their public schools.

*School vision.*—A special study of the visual defects in school children is now being carried on. This study is made to determine—

1. The incidence of visual defect in school children.
2. The significance of the varying degrees of refractive error.
3. The progressive change in the eyeball with advancing age.
4. The degree of myopia which may require special educational methods.

*Mentally and physically handicapped children.*—More than 8,000 children were examined mentally and physically in cooperation with the Illinois State Institute for Juvenile Research.

*Mental hygiene.*—A mental survey of over 50,000 children attending 663 schools and in 10 institutions in a number of States. The percentage of feeble-minded in the school population ranged from 0.3 per cent to 1.3 per cent.

*Physical and mental states of negro school children.*—There are approximately 2,000,000 negro children from 5 to 14 years of age in this country. Little is known of their physical and mental development. A special mental and physical study of about 3,000 colored children in Georgia is now being made.

*Growth and development.*—Special studies in the growth and development of children have been carried on in a selected community for several years. The results of these studies will furnish most important information on the growth of children.

The child hygiene office of the Public Health Service is prepared to answer inquiries on the following subjects: Prenatal care, care of the baby, physical and mental hygiene of the child, and school hygiene.

#### STANDARDIZATION OF DRUGS

The division of pharmacology of the Hygienic Laboratory, Public Health Service, may be considered one of the connecting links between abstract science and the application of science to the practice of medicine. A part of its function, as its name implies, is the determination of the action of drugs upon human beings as revealed by experiments on animals. The scope of the functions of the division can best be indicated by illustrations.

One of the activities in which the division is now engaged is an effort to standardize a group of products used in the treatment of

certain pathological conditions and for which chemical criteria of potency are not practicable, at least, from the standpoint of commercial production. An effort is being made to standardize these products through biologic tests. Included in this group are the following: The arsphenamines (antisyphilitic remedies), for which a special control under the biologics control act has been provided; insulin, used in the treatment of diabetes; digitalis, used in the treatment of certain diseases of the heart; and pituitary extract, used extensively by obstetricians to induce labor in childbirth and to overcome postpartum hemorrhages.

It is the function of the division of pharmacology to work out methods for determining the potency of these various products—the actual work of putting these standards into effect being the function of other officials of the Public Health Service, the Bureau of Chemistry of the Department of Agriculture, and State and municipal officials. The United States Pharmacopœia has adopted the standard of potency for pituitary extract and the biologic tests for arsphenamine and neoarsphenamine worked out by this division.

The importance of an accurate scientific standard in the terms of which the potency of each ampule of the various products may be stated is obvious when it is considered that the physician who prescribes or administers such remedies must have knowledge of the probable effect of his prescriptions. The health committee of the League of Nations has called two international conferences to discuss standardization of medicines such as those mentioned, and Prof. Carl Voegtlin, chief of the division of pharmacology, attended these conferences, in an unofficial capacity, as one of the American delegates.

Another problem which has received considerable attention from the division deals with the development of chemicals which may be used as specifics in the treatment of various infectious diseases, the type of treatment known as chemotherapy. As a part of this work experimental syphilis has been produced in rabbits, and one result from this series of experiments was the development of a method of producing a drug known as sulpharsphenamine, a product used in the treatment of syphilis, and which has the advantage that it may be injected hypodermically into small children or intramuscularly in those adults for whom intravenous injections are impracticable.

The division, furthermore, has discovered new facts concerning the complicated manner in which the arsphenamines sterilize the body infected with syphilis and related diseases. This is a question of real pertinence, inasmuch as arsphenamine and its derivatives even in concentrated solutions will not kill these organisms in a test tube but will kill them in the body.

The newly discovered facts strongly support the idea that arsphenamine is converted in the body by partial oxidation into an active

modification which is responsible for the sterilizing effect and which must also be regarded as the immediate cause of some of the toxic reactions sometimes resulting from arsenical treatment. Effective methods for the prevention of these serious toxic reactions have been discovered, and further efforts are being made to render the arsenical treatment as safe as possible.

A study of cancer in its broad aspects is another of the problems now before the division of pharmacology. This investigation proceeds on the theory that cancer is an abnormal tissue growth. On this hypothesis the division has been experimenting with the growth of tissue from the heart muscle of an embryo chicken outside the body on the theory that a knowledge of the processes of normal cellular growth may aid in an understanding of abnormal growths.

Another phase of this work has been the successful transplanting of animal tumors from one animal to another, which revealed that the tumors which afflict one species will not grow in another species. Even in the case of animals so closely related as rats and mice the tumors transplanted will develop only to a very limited extent.

This fact, together with other evidence, has tended to establish the conviction that such a thing as a "cancer parasite," or an organism which specifically causes cancer, does not exist.

Some of the causes of cancer have been indicated by experiments on animals; notably the demonstration that painting the skin of rabbits or mice with coal tar for long periods will produce growths which are apparently real carcinoma.

It has also been shown that the presence of certain parasitic worms will produce cancerous growths in rats, and there is evidence, although it is not conclusive, that a continued application of arsenic to the skin will produce the same results. Animals bearing tumors are subjected to treatment with a great variety of chemicals with a view of finding a substance that will destroy the malignant growth.

Those who have worked on cancer in the Hygienic Laboratory have for the most part accepted what is now the prevalent opinion among investigators, that the distinction which should be drawn between the so-called benign and malignant growths is merely a difference in the rate of growth.

Still another phase of the cancer research work for the division is a study of the chemistry of normal tissue and a comparison of the data thus gained with corresponding data obtained from a study of the chemistry of cancerous tissue. Some evidence has been found to indicate a difference in the sugar metabolism, but nothing definite has been established.

In addition to the activities heretofore enumerated, the division of pharmacology is also engaged in a piece of research so fundamen-

tal in character that it can hardly be explained in nontechnical language. This is a study of the toxic action of various drugs upon living cells. At present the crude results of these actions are known in many instances, but the more intimate chemical nature of the actions is not known. It is a problem that involves the very fundamentals of pharmacology and toxicology.

The normal staff of the division of pharmacology consists of eight scientific workers, besides clerical assistants and attendants.

### SERUMS AND VACCINES

When the family physician in a small rural hamlet vaccinates the children of the neighborhood to protect them against smallpox, or minimizes the danger of diphtheria, he introduces into their systems substances which, if contaminated, might injure the children seriously and which, if not potent, will give no protection. Hence it is obviously very important that the physician have some assurance that the vaccines and antitoxins he uses are exactly what they purport to be and are not contaminated by any impurities.

If the physician happens to be also a chemist and a bacteriologist, and if he has the time, money, and inclination, he could assure himself on this subject by maintaining a laboratory of his own and testing all the vaccines or serums before he administers them. But if he did that he would have little time left to administer the products and, in any event, he seldom has the equipment and frequently does not have the training in chemistry and bacteriology which would insure accuracy of results.

Furthermore, there would be a tremendous waste of time and money if every physician were obliged to make these investigations for himself.

Obviously, the solution of the problem is a system of control of the manufacture and sale of such biologic products as will enable the physician to use these products without testing them and, at the same time, with confidence that the health of his patients is being protected. The United States Public Health Service, through the office of biologic products control in the hygienic laboratory, administers such a system.

This system of control was established by an act of Congress in 1902, about the time when the use of vaccines and similar products began to attain prevalence. In general the procedure is to license certain manufacturers to make specific products if the manufacturers comply with requirements laid down by law and regulations and if their products meet prescribed standards.

The products covered by the law and regulations—viruses, serums, toxins, antitoxin and analogous products applicable to the prevention or cure of diseases of man—are collectively referred to as



biologic products and by their very nature are particularly prone to become contaminated, or, in some instances, rapidly to lose their curative properties. It was because of these peculiar properties of this class of products that the necessity for some method of accurate control of their manufacture and sale was early recognized.

Licenses issued by the Secretary of the Treasury on recommendation of the Public Health Service are sought by foreign manufacturers of biologic products as well as by the American manufacturers. To the latter such licenses are an absolute necessity because without a license no manufacturer can offer his products for sale in interstate commerce or for export. One standard is adopted for all products regardless of whether they are intended for domestic or foreign consumption.

This single high standard has resulted in the American license to manufacture biologics being accepted as a hall mark of quality wherever such products are used. It is for this reason that the foreign manufacturers seek American licenses even though they may have no intention of competing with the American manufacturer in the American market.

At the close of 1926, 36 American manufacturers and 11 foreign establishments held American licenses to manufacture biologic products. The foreign manufacturers include the Pasteur Institute of Paris and others of high standing.

The Federal Government is not engaged in the manufacture of biologic products, efforts being directed to control only. Competition between manufacturers is free, subject only to minimum standards imposed by the licensing authority; for it should be remembered that the standards set by the regulations controlling biologic products are minimum standards, and manufacturers are not only permitted, but encouraged, to exceed these standards in the potency of their products.

Before a manufacturer, either domestic or foreign, is licensed by the Secretary of the Treasury, an inspection is made by a commissioned officer of the Public Health Service. The inspection covers plant, personnel, and product. The license will not be issued unless it is shown that the manufacturer has an adequate plant in proper condition, that his personnel is competent, and that his product meets the standards set by the Public Health Service.

Domestic manufacturing plants are inspected at least once a year after the license has been granted, and foreign biologic products are inspected at customs ports before they are admitted to the country. Laboratory examinations of products of all manufacturers are made at more frequent intervals.

The Hygienic Laboratory has the custody of the diphtheria and tetanus antitoxin standard units—samples of these products of known



strength—and at regular intervals the laboratory distributes these two products to other laboratories and manufacturers throughout the world to serve as a standard of comparison for the products manufactured by them. This arrangement has been in effect for about 20 years and is carried on by common consent.

The granting of a license to a manufacturer does not imply indorsement by the Public Health Service of all the claims which the manufacturer may make for his products. An effort is made to distinguish between products concerning the value of which there may be a difference of opinion among the best authorities, and absolute frauds which may also be harmful to the patient. As an example of the former may be cited many bacterial vaccines used for treatment or prevention of disease, and while the question of value of these products is being determined, the public meanwhile is assured a properly prepared product.

It would be a serious matter to refuse a license for a product if the claim advanced that it would be of aid in combating some disease were valid. Great care is accordingly exercised before a decision is made.

At present an exhaustive investigation is being made to determine the accuracy of claims advanced on behalf of an antimeasles serum produced from the blood of animals. This serum, if it should prove to be effective as claimed, would be of inestimable value in combating measles in young children. In extreme cases where the question of proper procedure in the matter of license is very difficult to determine, the opinion of the advisory board of the Hygienic Laboratory may be obtained. This board is composed of nine members, all nationally known authorities.

The granting of a license means that inspections of the establishment concerned and laboratory examinations of samples of its products are made regularly to insure the observance of safe methods of manufacture, to ascertain freedom from contamination, and to determine the potency of diphtheria antitoxin, tetanus antitoxin, botulinus antitoxin, antidysenteric serum, antimeningococcic serum, antipneumococcic serum, bacterial vaccines prepared from typhoid bacillus, paratyphoid bacillus A and paratyphoid bacillus B, diphtheria toxin-antitoxin mixture, and diphtheria toxin for Schick test, the only products for which potency standards or tests have been established.

#### OXYGEN AS REGARDS LIFE

Political prisoners and professional fasters have been known to live for months without food. Explorers and ships' crews have survived for days without water. Complete deprivation of oxygen would mean death to the human machine in a few minutes.

This importance of oxygen has dominated the thought of physiologists ever since the discovery of oxygen as the most significant element in our atmosphere; but even to-day the manner in which oxygen, once it is brought to the cells, enters intimately into the chemistry of life is so obscure as to be a subject of controversy.

The division of chemistry of the Hygienic Laboratory has found that several chemical processes which have been thought to be intimately related to oxidation in the living cell are not necessarily dependent upon the participation of oxygen, or for that matter, upon the element hydrogen which is supposed to be involved whenever oxygen acts to form water. Instead, these processes are essentially exchanges of certain of the electrons contained in the substances taking part in the processes.

A noteworthy example is the bleaching of indigo, formerly accomplished by bacterial fermentations, and now accomplished with certain chemicals called reducers. Essentially this type of bleaching is the driving of a pair of electrons into the dye molecule. The structure is then so changed that the substance no longer absorbs visible light and hence is colorless. By a well-known electrical device, applied hitherto to inorganic compounds, the division of chemistry is measuring the driving forces with which one set of organic compounds, such as indigo and its reduction product, tends to transfer its electrons to another set. It is thus building up a body of quantitative data with which there can be predicted in exact quantitative language the direction and extent of these electron transfers between specific sets of substances.

The division has also measured directly, and indirectly, by the use of the dyes it has studied, the driving force with which several species of living cells tend to alter organic compounds in the direction of a greater ease of electron escapement. In certain cultures of bacteria, which are accustomed to live in the absence of oxygen, this driving force is found to be the highest which it is theoretically possible to attain without disrupting the molecules of the water in which the bacteria live. Workers in Europe are injecting into living cells the dyes, the electron affinities of which are now known from the studies of the division of chemistry.

This "micro surgery" is being done with instruments designed by Professor Chambers, of Cornell University, and is so delicate that high-power microscopes are necessary to watch the manipulation. If the results are confirmed they will necessitate radical revisions of the methods of attacking what the physiologists regard as the chief problem, namely, the manner in which oxygen enters the chemistry of life.

By the irony of fate the newer developments have deprived the physiologists of some of their favorite tests, but they have made these

tests the subject of a new field of research—that of electron exchanges in which oxygen may never be directly involved.

While the chief accomplishment to date is a partial clarification of the confused and highly technical concepts which are concerned in this vitally important physiological subject, several incidental matters of some immediate importance have been studied. By the methods employed there are revealed exact data, hitherto unattained, concerning the chemistry of some common dyes and of new dyes which the division has designed and synthesized to fit its particular purposes.

By use of the concepts developed there has been gained an insight into the action of certain "oxidative" disinfectants such as iodine and chlorine, the latter being used extensively to lower the bacterial contamination of water supplies.

In this connection it may be said that it was clear to the chemists of the division of chemistry before studies of the "chlorine cure for the common cold" were begun systematically, that, irrespective of any indirect benefit which might be found, there could be no significant disinfectant action by chlorine used at reasonable concentrations. The detoxifying action of the organic matter of water supplies is being studied with a view to increasing the efficiency of control in dosing water supplies with chlorine.

The data now at hand concerning the nature of certain chemical transformations brought about by those microorganisms accustomed to living without the benefits of oxygen provide a new basis from which to survey the life of these strange living things. Some of these so-called anaerobes are the most virulent of man's enemies, and their cultural management is part of the daily routine of disease control.

Few of these practical applications have as yet been brought to full fruition, because almost the entire time of the small staff of the laboratory has been devoted to the theoretical aspects. The careful establishment of reliable data and the painstaking development of theory, the terms of which are too technical and too guarded for purposes of brief description, are essential; the more so since the abundance of practical applications which are appearing have already tempted others to venture where the way is not prepared.

In addition to researches on the subject outlined, the division has synthesized some new indicators useful in determining the intensities of acidities (technically the hydrogen ion concentrations) of biological solutions. It has developed a new test for cysteine, a substance which alone or in combination is very important in the oxidative and defensive mechanisms of the body. It has contributed to the theory of water clarification by alum with resulting savings in the alum bills of several municipalities. It made the chemical analyses in the recent investigation of possible hazards in the use of tetra-

ethyl lead. It has developed a new test for phenols, of which carbolic acid is a representative, and has described the essential chemistry of numerous other tests in a comprehensive review of the literature.

It is attempting to supply the biologist with a rational account of a certain type of color test used in the differentiation of cells, and known as the indophenol test. It carries on routine analyses of the arsenical preparations used in the treatment of syphilis and the manufacture of which is licensed by the Treasury Department, and it is developing new methods of analyzing these preparations with a view to stricter control.

Essentially the division of chemistry is a small research unit of nine active investigators, in which there exists an appreciation of the rapidity with which existing knowledge of the chemistry of living cells is exhausted in attempts to solve some of the more baffling problems of medicine and public health. It therefore concentrates its chief activity upon the problem first mentioned in this sketch with the confident hope that the solution will be of fundamental importance to very many problems of biochemistry and medicine.

#### STREAM POLLUTION

Wherever a human being lives, there is a problem of sewage disposal, and also a problem of drinking water supply. From time immemorial man has used the rivers, streams, and lakes to solve both problems; and nature, through processes which are not yet fully understood by science, has done much to minimize the obvious dangers of such procedure.

But there is a limit to nature's capacity to purify sewage-contaminated water; and as the density of population increases with the advance of civilization, the dangers of using the same stream for sewage-disposal plant and water supply increase tremendously. Unless science comes to the aid of nature, man will have to seek other safe methods of sewage disposal or else find other sources of water supply. Either alternative presents important economic difficulties.

The importance of the problem will be realized upon consideration that between 85 and 90 per cent of the sewage of all the cities in the United States is discharged without treatment into the most convenient stream. And the percentage of cities which utilize these same streams for their supplies of drinking water is probably as high as is that of the total amount of sewage discharged into the streams.

It is unnecessary to point out the menace to public health involved in practices of this kind, and for the past 16 years the Public Health Service has been engaged in work designed to minimize this evil. The actual solution of the problems depends, of course, upon the cooperation of the various local governments, State and municipal.



Hence the Public Health Service has limited its efforts to what it conceives to be the proper field for Federal activity—the gathering and disseminating of information which may be used by the local authorities as the basis for such action as they may see fit to take.

This work of the Public Health Service was interrupted somewhat by war-time exigencies, but since 1919 it has been going forward to the limit of available resources. Its principal activities in recent years have been the following:

- (1) A study of the pollution and natural purification of the Illinois River, undertaken chiefly to check and extend observations previously made on the Potomac and Ohio Rivers relative to the laws governing natural purification in streams.

- (2) A survey of representative municipal sewage-disposal plants in various parts of the United States to collect information as to their efficiency and cost in actual operation.

- (3) A collective study of municipal water-purification plants, chiefly rapid sand filters, as operated in a number of cities on the Ohio River and elsewhere, with a special view to ascertaining more precisely the relations between pollution of the raw water and quality of the effluent under varying processes and conditions of operation.

The high cost of field surveys in recent years and the lack of sufficient appropriations have forced the Public Health Service to give up the work it had previously undertaken in the coastal waters. This work had, however, progressed to a point where fairly definite results had been obtained particularly with respect to dangers of contamination of shellfish by sewage discharged from coastal cities. The work of the organization at present is carried on through headquarters at Cincinnati, the center of experimental studies and the base from which parties have been sent out for work in the field.

Many of the problems are of such a nature that they can be solved by the local authorities of each city independently of other cities, but in cases where there are a number of cities along one large river and the water supply of each city comes from the stream into which other cities upstream have discharged their sewage, the problem becomes very complicated. Obviously, one city can not control the acts of another city, and in many instances cities in several States are involved. Under such conditions, the National Government, through the Public Health Service, has a very definite duty to perform.

The Public Health Service has come to the conclusion that the data needed for laying out a comprehensive plan for controlling the pollution of an entire river system with due regard for safety, equitable distribution of control, and economy are as follows:

- (1) It is necessary to establish some quite definite and objective criterion of the quality which is to be maintained in the water supplies taken from the river as they are delivered to the consumers after



artificial purification. This criterion or standard must be in terms of measurable characteristics, determinable by quantitative bacteriological or chemical examinations. It must be rigid enough to insure safety beyond any reasonable question, but not much more rigid than is actually necessary, lest it impose an excessive burden of costs.

(2) It is necessary to have a fairly precise knowledge of the reliability and efficiency of such purification processes as can be applied at a reasonable cost to purification of the raw water available at the best practicable intake, for it is this efficiency, taken in connection with the standards set for the final effluent, that determines the upper limits of the pollution which may be tolerated at the intake.

(3) It is necessary to know what proportionate part of each of the sewered communities, situated at varying distances upstream, contributes to the pollution existing at any given intake, for otherwise it is impossible to estimate what effect elimination or reduction of the pollution from any single community will have in reducing the pollution in the intake zone.

This, in turn, implies a fairly precise quantitative knowledge of the laws governing the processes of natural purification, and of how they may vary in different types of streams in relation to various climatic, seasonal, and hydrographic conditions, for it is only through such knowledge that these great protective processes which nature has provided may be used most effectively, and not to use them is to waste a natural resource of enormous economic importance.

In view of the needs outlined, the Public Health Service has consistently directed its investigations of stream pollution toward such undertakings as the attempt to improve technical methods for laboratory determinations, to evaluate the efficiency of filtration plants under the adverse conditions of loading which may be anticipated in the future, and to add something to the present scanty knowledge of the laws of natural purification. Information of this kind, though it may seem academic at present, will be essential to sound sanitary engineering in the future.

#### RURAL SANITATION

It is the general impression that persons who live in the country enjoy better health than those in the city. At first thought there seem to be many reasons why this should be so. An abundance of fresh air and sunshine, life in the open, physical exercise, fresh eggs, milk, and green vegetables—all of these, and more, would seem to favor the rural inhabitant so strongly that the city dweller would have difficulty in overcoming his natural handicap and in attaining the degree of health and stamina of his country cousin.

Surprising as it may seem, however, the natural advantages which the country affords have been offset by failure to recognize their value

and lack of knowledge of how to secure their benefits. Moreover, many of our most destructive though avoidable diseases have flourished in the country because their causes and methods of prevention have not been understood.

This is not a reflection upon the intelligence of the countryman as contrasted with that of the city dweller. It means simply that the latter, often without his knowledge, is afforded sanitary protection through his municipal health agencies without which he would speedily become the victim of epidemic pestilence.

As the vast majority of our rural population is not yet provided with any agency capable of affording adequate health protection, it is a fact that our rural inhabitants, in order to protect themselves against disease, must have a higher degree of health understanding than those who live in the cities. Whatever they do in this respect must be devised and put into effect through their own thought and initiative. At best, however, individual health protection is inadequate as it is hardly practicable for one who lives in an insanitary environment to guard indefinitely against diseases which thrive under such conditions.

As recently as 15 years ago it was the general opinion among public health authorities and others that, deplorable though it was, little could be done to improve grossly insanitary conditions common throughout our rural sections, and to reduce the high incidence of preventable, communicable diseases to which they gave rise. Typhoid fever, hookworm diseases and other intestinal parasitic infections, infectious diarrhea, dysentery, malaria, and other diseases were very prevalent, and people for the most part accepted the resulting incapacity, loss of life, and economic losses as acts of Providence rather than as retribution for ignorance and sloth. One who advocated sanitation in those regions at that time as a remedy for such maladies would have been ridiculed and disregarded by the vast majority of the population.

Finally, in 1911, the scourge of typhoid fever had become so great in one of our most fertile and important agricultural sections that the United States Public Health Service was appealed to for relief. As might be expected, it was found that insanitary disposal of human wastes, coupled with inadequate protection of individual water supplies and careless handling of milk and other foodstuffs, was responsible for the widespread infection.

Public meetings were held throughout the county by the State and Government health officials who were working in cooperation with each other, the causes of the epidemic were painstakingly explained to the people who, because of their sufferings, were willing to listen, and their cooperation was sought in remedying insanitary conditions and practices. The result was the cleaning up of the county, the inauguration of sanitary methods of waste disposal, the protection of

wells against pollution, the cleaner handling of milk and other food supplies, and the suppression of the typhoid fever.

Typhoid fever outbreaks had been controlled before; but although the people had been willing to improve conditions temporarily, they had settled back into their old insanitary practices as soon as the immediate danger had subsided. In the case at issue, however, the Public Health Service determined to impress upon these people the necessity of maintaining sanitary conditions permanently in order to avoid similar disastrous epidemics in the future, and toward this end it advocated the employment of a physician trained in public health methods who should devote his entire time to securing and maintaining better sanitary conditions, informing the citizens as to measures for the protection and promotion of their health, and enlisting their intelligent and active cooperation in the work. The plan was adopted, and thus in Yakima County, Wash., was launched the first full-time county health officer in the United States.

From the results of the work of this pioneer county health officer it soon became apparent that country people were able to perceive the advantages of modern community sanitation when it was clearly demonstrated, and that once convinced of its benefits they were willing to support it. Beginning with that time, therefore, the Public Health Service has endeavored through every means at its command to encourage the development and maintenance of efficient whole-time health service in rural sections of this country.

From one county, in 1911, the plan has been extended until, at the beginning of the calendar year 1926, 307 of the 2,085 rural counties in the United States have been provided with full-time health officers and sufficient personnel in the way of public health nurses, sanitary inspectors, and other assistants to insure to their people a reasonably adequate degree of health protection.

State health officials now, instead of deploring the fact that there is nothing that can be done to reduce preventable diseases in the rural sections, are convinced that the solution lies in the development of local full-time health service and are eagerly availing themselves of every possible assistance from their own and the Federal Government to enable them to put this work into effect. The need of enthusiasm and interest is great in view of the fact that 84 per cent of our rural population are still without adequate health protection of the kind indicated.

The Federal appropriation for the support of this activity is "for special studies of, and demonstration work in, rural sanitation." In each demonstration project the rural sanitation work is made a part of a well-balanced, comprehensive program of health work, and is conducted in cooperation with the State and local health authorities. The cooperation is offered upon the condition that whole-time

local (county or district) health service be established. Part of the money (usually over 50 per cent) for the support of the work must be furnished from local governmental sources.

The whole-time local health officer, or sanitary officer, serves as director of the demonstration and must present qualifications for the work acceptable to each of the cooperating agencies. The sanitary inspectors, health nurses, and any other assistants in the county health service work under his direction.

All salient branches of health work, such as acute communicable disease-control measures, general sanitation of private homes and public places, malaria prevention, tuberculosis control, goiter prevention, infant and maternity hygiene, venereal-disease prevention, school hygiene, and the like are carried out. Attention is concentrated upon the different branches of the work in what appears to be the most advantageous sequence.

The various activities are dovetailed with one another so that every dollar invested and every unit of energy expended may yield the biggest possible dividend in disease prevention and health promotion. The plan has proved economical and effective under a range of conditions sufficiently wide to indicate that it might be applied with advantage to all rural communities in the United States.

As an example of the results which are possible through the development of organized health service in rural counties may be mentioned a county in Alabama. That county has a population of about 50,000. The average annual death rate per thousand of population for the five-year period before the whole-time county health service was started was about 19; in the three years following it was about 12. This means about 350 less deaths a year in the county. The lowering of the number of deaths by 350 means also the prevention of about 3,500 cases of incapacitating illness.

The average case of such illness costs about \$100 in wage loss and attendance upon the sick. Thus the saving to the citizens of that county is about \$350,000 a year. The whole-time county health service has been maintained at a cost of about \$14,000 a year.

If the dividend yield on an investment for whole-time health service in our average rural county should be only one-fourth of this—and the evidence is that it would be at least that much—belief in the efficacy of this plan of work is most certainly justified.

While various plans for the introduction of specialized lines of public work into rural communities have been tried from time to time, the need is not for numerous dissociated activities each with its independent backer, but rather for a single, efficient, full-time, county health agency through which the measures necessary for the benefit and protection of the public health may be conducted in logical sequence and in proper relation to one another.



It is now becoming the custom for organizations entering the public health field for the promotion or conduct of some specialized activity, such as typhoid-fever prevention, hookworm control, tuberculosis prevention, trachoma control, malaria control, venereal-disease prevention, or advancement of child and maternity hygiene, to dovetail them in with, and make them a part of, a well-rounded comprehensive program of local official health service under the immediate direction of a qualified whole-time local health officer.

As the best possible plan for the prevention and control of epidemic diseases, and for the prevention of the spread of disease between the States, one may look forward to the development of efficient full-time local health service, especially in our coastal and border States and in the States through which our main lines of automobile travel pass. Communicable diseases would then be detected in their incipency and suppressed before they had a chance to spread.

#### HEALTH ADMINISTRATION

During 1924 the Public Health Service, cooperating with a committee on administrative health department practice of the American Public Health Association, completed a survey of the public health activities then being carried on in the 100 largest cities in the United States. A similar survey had been undertaken by this committee in 1920, and it was thought that resurveys from time to time would serve to point out the progress made in public health administration.

In order to fill a long-felt need for some central clearing house of information, one that could render a real service to health officials and others interested in health-promotion activities, the Public Health Service, in 1923, established an office of administrative health practice, under the direction of Dr. Paul Preble.

For a number of years the Public Health Service has been engaged in making health surveys and studies of administrative health practice of State and municipal departments of health for the purpose of encouraging and promoting the development and expansion of these official agencies. No systematic attempt, however, had ever been made to carry out a comprehensive survey of large groups of cities prior to the surveys of 1920 and 1924.

Coming near the close of the first half century of our modern public health movement, the survey of 1924 made it possible to pause a moment and consider the progress of public health and sanitation in this country during this epochal period of 50 years.

Our present conception of public health or preventive medicine, as a real service, grew out of the "germ theory of disease," which overthrew traditional theories of disease causation and established modern health service on a more scientific foundation.



Public health practice in this country has been influenced largely by the adoption of a theory of local self-government. Except for the minimum requirements promulgated through the police powers exercised by State authorities, there is no effective central supervision or jurisdiction over our national health. The word "health" does not appear in our Constitution, but foundations for the protection of health, national, State, and municipal, were laid during early colonial times.

Each community has, rather independently, developed its own resources; and for this reason progress in public health activities has been haphazard, affected often by frequent political changes, and consequently the result of alternating periods of activity and depression, and hurried attempts to meet special emergencies.

It is not surprising, therefore, that the survey of 1924 discloses a considerable lack of uniformity in the methods and procedures adopted by different cities. The general trend of the public health movement during the past half century has, on the whole, been rather encouraging, even though real progress has been relatively slow.

The history of public health covering this 50-year period is filled with many notable achievements, both at home and abroad, and enduring monuments will remain to perpetuate the memories of many heroes and martyrs whose contributions and sacrifices have served to alleviate human suffering and make pestilential areas safe for mankind.

The information and data collected in 1924 have been carefully analyzed, and a voluminous report, recently published, contains special monographs, each covering one function of municipal health service and prepared by authors chosen, for the most part, because of their recognized standing in public health matters. As far as practicable, this report attempts to present a coordinated study of all the essential activities embraced in a modern community health service.

All statistical data of particular value to the interpretation of the information collected have been included in the report. Special summaries and conclusions have been followed by specific recommendations which set forth, wherever feasible, the author's conception of what constitutes the best practice or the nearest approach to a reasonably adequate scheme or program approaching the "ideal" in modern health service.

The possible benefits to be derived from a systematic survey are many and far-reaching. It is the only reliable means of determining the assets and liabilities of a community in terms of health. It is as essential to the continued progress of health services as periodic stock taking is in the commercial field.

Constructive sanitary reforms and reorganizations of health departments are dependent upon detailed surveys, which serve as the basis of future policies of administration. Fortified by the data collected through such a survey, the health officer is in position to justify his estimates before his finance committee and strengthen his appeal to the city council for additional resources which will enable him further to develop his administration.

The survey data are practically the only means of showing returns for money already invested.

Periodic surveys are extremely valuable means of checking up on the progress made *ad interim*. In the absence of a satisfactory survey, reforms or campaigns directed toward some particular disease or condition are prone to result in one-sided or poorly balanced programs. Modern ideas of city management and the effort to introduce methods of economy with efficiency must be founded upon facts and sound businesslike principles.

There is a growing tendency to encourage the standardization of public health work. Certain phases of this work have already been quite definitely standardized on the basis of scientific facts or as the result of years of experimentation. General surveys of large groups of cities make it possible to compare the effectiveness of various methods and to select those that have stood the test of time and experience under varying conditions and give promise of adequate returns.

Group surveys make it possible to arrive at relative values as between different procedures and permit fairly satisfactory evaluations of the more essential functions of a health service. Standardization, however desirable, should not discourage further experimentation and the development of new theories and principles of public health practice.

Careful analysis of the information and data collected in 1924 has disclosed many discrepancies and inconsistencies in present-day public health practice, many of which can not be reconciled with our present knowledge. As was to be expected, each item of local administration is met with a great variety of methods and procedures. Rule-of-thumb methods are frequently practiced and traditional theories that have outlived their usefulness have been perpetuated.

Balance of program, so vital to successful public health administration, is frequently lacking, and in many instances but little real progress has been made in applying the more recently established principles of scientific public health practice.

Compared to conditions existing even a decade ago, the findings of 1924 yield some grounds for encouragement; but there still remain many indications of defective administration, unprofitable procedures, and overlooked or neglected opportunities. Approxi-

mately 40 per cent of the 100 largest cities are still provided with part-time health officers. The average salary of this important official for the entire group is approximately \$4,000 per annum. In nearly 30 per cent of these cities, appointment of personnel is still disturbed by political changes in the city administration.

There is still considerable confusion in the responsibility for the registration of births and deaths, and the data as published lack uniformity. Only 79 of the 100 large cities were in the birth registration area in 1924. There are many indications of lack of worthwhile epidemiological studies.

Terminal fumigation after death or recovery from acute contagious diseases is still practiced in 68 of the 100 cities, although the ineffectiveness of this procedure as a routine practice has long since been conclusively demonstrated.

In half of this group the health officer still exercises jurisdiction over the inspection of plumbing and 24 health departments are still charged with supervision over the collection and disposal of garbage, functions which have no direct bearing upon public health.

Although the necessity for proper pasteurization of milk supplies in large cities is rather universally accepted, in only 27 of the 100 cities in 1924 was the milk supply pasteurized to the extent of 95 per cent or over. It is also important, in this connection, to note that less than 60 per cent of the milk-producing herds had been tuberculin tested.

Facilities for hospital care of the sick are generally inadequate. Reasonably adequate facilities and provisions for prenatal and obstetrical care are rather universally lacking. Public health nursing service is only about 50 per cent adequate and there is usually an absence of central supervision or coordination of the agencies applying themselves to infant and child care.

It is to be hoped that the report, by emphasizing the more serious defects in our present administration programs, will encourage health officers to recognize the need of a thorough and substantial housecleaning that will enable them to revise and reorganize their programs so that their available resources may be more advantageously expended upon a sound businesslike basis.

By pointing out the shortcomings as well as the high points of present-day practice, the recent survey should serve to encourage the adoption of better methods and a more critical examination of existing conditions and requirements. It is proposed to carry on special studies of the more essential activities in order to establish principles and perfect technique.

On the basis of the data already collected, a bureau of information for health officials will be organized as a central clearing house for the distribution of information collected as the result of further

efforts to "study and investigate the diseases of man and conditions influencing the propagation and spread thereof" as authorized by the act of Congress of August 14, 1912.

### INTERPRETING HEALTH STATISTICS

Facts are of little value unless they are interpreted. An unabridged dictionary contains, theoretically, all the words in a language, but it doesn't carry any message to the reader because the words are not arranged for that purpose. But those same words manipulated by a skilled author can tell any message which the human brain can conceive.

The interpretation of facts is the function of the office of statistical investigations of the Bureau of the Public Health Service. This unit of the service consists of a small staff of statisticians, clerks, and operatives whose business it is to analyze and draw conclusions from the large mass of information gathered each year by the other agencies of the service, particularly the other offices in the division of scientific research. In some lines this office undertakes research projects of its own, but, in general, its function is to cooperate with the other offices.

The existence of the office of statistical investigations largely eliminates the necessity for several more individual statistical units which otherwise would be needed to carry on this phase of the work of the Public Health Service. Wherever a large epidemiological study is planned and carried out, and its results are analyzed, this office is relied upon for assistance in interpreting the data gathered by the other offices. It is continually called upon by other divisions for technical advice in handling statistical news. The office might well be described as a statistical service station for the entire Bureau of the Public Health Service.

The work of this office does not begin when the work of the other offices is finished; it begins before the actual epidemiological investigation in the field starts. For it is obvious that if the Public Health Service is seeking information of a certain kind, let us say, the relation between a certain occupation and a certain disease, there must be some agreement as to what facts are pertinent to the investigation before the investigators begin to work.

The statisticians of this office are therefore called into conference with other offices before each important bit of field research work is undertaken.

Usually it is necessary to draw up certain forms upon which the reports of the investigators are to be made. This facilitates the analysis of the data and insures thoroughness and accuracy in reporting. It is necessary not only to agree upon what facts shall be sought,



but upon what indications may be accepted, for the purposes of the inquiry, as showing the existence of those facts.

When the investigation has been completed in the field and the data have been brought into the headquarters of the Public Health Service in Washington, the analytical work of the office of statistical investigations begins. Frequently it is found advisable to call in some of the investigators who are familiar with the data gathered in the field; they work in cooperation with the statisticians in the office. The general plan is to have the work done, so far as possible, by the permanent staff of the office, both for reasons of economy of administration and also for the purpose of having all statistical work done as nearly as practicable along uniform lines so that the relationship between the various groups of data can be ascertained.

One of the important activities in which the office is engaged at present is an investigation of the incidence of disease upon the population in general. To do that, the task of keeping in touch with the health records of approximately 10,000 persons in a typical American community over a period of three years was undertaken. Some of the data thus obtained give surprising results when compared with the mortality figures. For instance, it was found that for every death from respiratory diseases there were about 350 illnesses from those diseases; while for every death from certain classes of heart trouble there were only 10 cases reported. This indicated that the prevalence of ill health can not be ascertained from mortality statistics alone.

The Public Health Service has an arrangement with a group of large industrial establishments which employ, in the aggregate, about a quarter of a million persons, whereby the companies make health reports on all of their employees. In return for this service the statistical staff analyzes these figures for each industrial establishment so that the management of each plant can ascertain what diseases are the most serious problems among their employees.

A study of the common colds recently completed showed that the prevalence of this disease is practically the same throughout the United States without any sectional variations—a result that was rather surprising to many persons.

It also was shown that the seasonal fluctuations in the prevalence of colds is practically uniform throughout the United States regardless of climatic variations.

The office of statistical investigations prepares, as a matter of routine, reports dealing with the world prevalence of disease, special papers on epidemics, incidence of disease and sickness from various causes, statistical methods as applied to public-health problems, and many other subjects which are statistical in their nature.



### PUBLICATIONS

The United States Public Health Service makes known the results of its special research work regarding the cause, spread, and prevention of disease, and its studies in sanitation and other fields of public health, by means of official publications, especially laboratory bulletins, which are more or less technical in nature, and public-health bulletins and articles printed in the **PUBLIC HEALTH REPORTS**, a weekly publication which has been issued by the service since 1878. In addition to these special articles, the **PUBLIC HEALTH REPORTS** contains current information on disease prevalence collected from various sources, both domestic and foreign. Many of the publications of the Public Health Service are available for free distribution and may be obtained on request. Others may be purchased at a nominal price from the Government Printing Office or may be consulted in public and medical libraries. Additional information regarding the work and publications of the service may be had by addressing the Surgeon General, United States Public Health Service, Washington, D. C.

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### DIPHTHERIA CASES IN THE UNITED STATES, 1923-1926

For several years the number of cases of diphtheria reported in the United States has been decreasing. Reports from State health officers for 11 months of the years 1923 to 1926, inclusive, show a remarkably steady decrease in the number of cases of this disease reported.

In the table printed below data are given from 39 States and the District of Columbia for 11 months of the years 1923 to 1926, inclusive. All States were included for which the information was available when the table was prepared.

The table shows that the number of cases reported in 1926 was 38.91 per cent less than the number in 1923.

The falling off in the figures each year from those for the preceding year was 16.52 per cent in 1924, 20.26 per cent in 1925, and 8.23 per cent in 1926.

The New England States showed the greatest improvement, the figure for 1926 being 59.49 per cent below that for 1923. The East South Central States were the only group which showed an increase for the four years, and this increase amounted to only 1.94 per cent. In general, the improvement was greatest in the eastern and northern sections and least in the southern groups of States.

*Cases of diphtheria reported during 11 months of 1926, by State health officers compared with similar reports for the same period of the years 1925, 1924, and 1923*

	First quarter	Second quarter	Third quarter	October and No- vember	Total, 11 months
<b>New England:</b>					
Maine—					
1926	47	36	30	34	147
1925	98	45	57	44	244
1924	154	125	93	170	542
1923	108	64	76	125	373
Massachusetts—					
1926	968	709	510	709	2,896
1925	1,504	1,102	747	739	4,092
1924	2,537	1,763	1,110	1,203	6,613
1923	2,243	1,816	1,646	2,211	7,916
Rhode Island—					
1926	137	66	46	91	340
1925	177	106	55	78	416
1924	231	162	125	135	653
1923	216	178	133	185	712
Connecticut—					
1926	550	202	140	221	1,122
1925	654	363	211	299	1,527
1924	698	390	335	394	1,817
1923	749	539	366	467	2,121
Total—					
1926	1,711	1,013	726	1,055	4,505
1925	2,433	1,616	1,070	1,160	6,279
1924	3,620	2,440	1,663	1,902	9,625
1923	3,316	2,597	2,221	2,988	11,122
<b>Middle Atlantic:</b>					
New York—					
1926	2,859	2,517	2,005	2,046	9,427
1925	3,902	4,500	1,976	1,903	12,371
1924	4,776	4,474	2,618	2,183	14,051
1923	4,104	3,454	2,407	3,351	13,316
New Jersey—					
1926	1,094	906	557	921	3,478
1925	1,244	890	737	808	3,679
1924	1,474	1,004	655	729	3,862
1923	2,106	1,196	929	1,176	5,407
Pennsylvania—					
1926	1,687	1,922	1,442	1,668	6,749
1925	2,889	2,551	1,751	2,098	9,289
1924	4,441	2,646	1,914	2,404	11,405
1923	4,343	2,838	2,625	4,071	13,877
Total—					
1926	5,640	5,345	4,004	4,665	19,654
1925	8,125	7,941	4,464	4,809	25,339
1924	10,691	8,124	5,187	5,316	29,318
1923	10,553	7,488	5,961	8,598	32,600
<b>East North Central:</b>					
Ohio—					
1926	1,266	1,018	1,024	2,208	5,516
1925	1,329	860	826	1,605	4,620
1924	2,324	1,098	798	1,325	5,545
1923	2,800	1,400	1,739	2,859	8,798
Indiana—					
1926	434	224	295	876	1,829
1925	549	281	253	674	1,757
1924	1,100	467	390	894	2,851
1923	1,167	477	444	1,206	3,294
Illinois—					
1926	1,234	993	709	1,074	4,010
1925	1,480	1,084	826	1,073	4,463
1924	2,474	1,419	1,052	1,250	6,195
1923	3,787	1,930	1,410	2,432	9,559
Michigan—					
1926	1,178	1,086	1,028	1,498	4,790
1925	1,060	842	627	948	3,477
1924	2,229	1,309	909	1,069	5,516
1923	2,049	1,318	1,390	2,023	6,780

*Cases of diphtheria reported during 11 months of 1926, by State health officers, compared with similar reports for the same period of the years 1925, 1924, and 1923—Continued*

	First quarter	Second quarter	Third quarter	October and No- vember	Total, 11 months
<b>East North Central—Continued.</b>					
Wisconsin—					
1926.....	620	413	359	473	1,865
1925.....	560	487	403	476	2,016
1924.....	913	613	460	524	2,510
1923.....	1,046	636	704	1,426	3,812
Total—					
1926.....	4,732	3,734	3,415	6,129	18,010
1925.....	4,978	3,554	3,025	4,776	16,333
1924.....	9,040	4,906	3,609	5,062	22,617
1923.....	10,849	5,761	5,687	9,946	32,243
<b>West North Central:</b>					
Minnesota—					
1926.....	678	725	502	776	2,681
1925.....	941	842	879	798	3,460
1924.....	1,108	714	680	1,019	3,521
1923.....	965	624	900	1,411	3,900
Missouri—					
1926.....	1,023	781	337	604	2,745
1925.....	985	770	388	757	2,900
1924.....	901	608	368	908	2,785
1923.....	1,162	660	679	1,190	3,691
North Dakota—					
1926.....	79	86	44	40	249
1925.....	83	45	38	62	228
1924.....	208	83	51	39	381
1923.....	213	68	101	202	584
South Dakota—					
1926.....	83	51	48	47	229
1925.....	94	42	55	49	240
1924.....	123	104	67	92	386
1923.....	191	168	114	205	678
Nebraska—					
1926.....	101	43	38	66	248
1925.....	125	90	51	110	376
1924.....	256	120	157	281	814
1923.....	303	129	177	247	856
Iowa—					
1926.....	224	124	141	246	735
1925.....	219	176	111	408	914
1924.....	319	163	128	176	786
1923.....	476	233	302	469	1,480
Kansas—					
1926.....	244	134	143	268	789
1925.....	460	160	114	270	1,004
1924.....	529	268	256	463	1,516
1923.....	694	328	384	874	2,280
Total—					
1926.....	2,432	1,944	1,253	2,047	7,676
1925.....	2,907	2,125	1,636	2,454	9,122
1924.....	3,444	2,060	1,717	2,978	10,199
1923.....	4,004	2,210	2,666	4,398	13,478
<b>South Atlantic:</b>					
Delaware—					
1926.....	47	26	17	23	113
1925.....	51	28	22	63	164
1924.....	87	44	16	34	181
1923.....	45	41	23	45	154
Maryland—					
1926.....	324	226	186	345	1,081
1925.....	462	318	253	328	1,361
1924.....	521	365	292	447	1,625
1923.....	838	427	325	535	2,125
District of Columbia—					
1926.....	284	171	124	256	835
1925.....	208	127	67	176	578
1924.....	111	75	55	95	336
1923.....	209	91	51	151	502
Virginia—					
1926.....	461	199	472	1,340	2,472
1925.....	494	242	701	1,259	2,696
1924.....	711	259	706	1,245	2,921
1923.....	1,102	406	879	1,726	4,113

*Cases of diphtheria reported during 11 months of 1926, by State health officers, compared with similar reports for the same period of the years 1925, 1924, and 1923—Continued*

	First quarter	Second quarter	Third quarter	October and No- vember	Total, 11 months
<b>South Atlantic—Continued.</b>					
West Virginia—					
1926.....	248	145	188	505	1,086
1925.....	286	119	178	373	956
1924.....	359	179	238	395	1,171
1923.....	498	234	404	632	1,768
North Carolina—					
1926.....	427	220	641	1,518	2,806
1925.....	475	255	952	1,500	3,182
1924.....	466	259	1,389	1,665	3,779
1923.....	566	283	1,272	2,171	4,292
Georgia—					
1926.....	170	118	233	760	1,281
1925.....	217	124	183	326	850
1924.....	171	120	184	417	892
1923.....	205	141	210	459	1,015
Florida—					
1926.....	200	198	201	387	986
1925.....	121	113	198	233	665
1924.....	178	81	156	188	603
1923.....	138	68	130	194	530
<b>Total—</b>					
1926.....	2,161	1,303	2,062	5,134	10,660
1925.....	2,314	1,326	2,554	4,258	10,452
1924.....	2,604	1,382	3,036	4,486	11,508
1923.....	3,601	1,691	3,294	5,913	14,499
<b>East South Central:</b>					
Mississippi—					
1926.....	329	140	256	473	1,198
1925.....	266	131	323	488	1,208
1924.....	246	159	293	378	1,076
1923.....	260	116	545	707	1,628
Tennessee—					
1926.....	177	138	200	981	1,496
1925.....	209	75	126	221	631
1924.....	156	69	171	298	694
1923.....	167	67	253	355	842
Alabama—					
1926.....	249	105	231	722	1,307
1925.....	267	105	289	518	1,179
1924.....	171	96	242	491	1,000
1923.....	255	150	466	584	1,455
<b>Total—</b>					
1926.....	755	383	687	2,176	4,001
1925.....	742	311	738	1,227	3,018
1924.....	573	324	706	1,167	2,770
1923.....	682	333	1,264	1,646	3,925
<b>West South Central:</b>					
Arkansas—					
1926.....	72	18	28	84	202
1925.....	98	33	40	123	294
1924.....	108	38	52	115	313
1923.....	103	41	69	215	428
Louisiana—					
1926.....	235	98	154	338	825
1925.....	262	124	157	258	801
1924.....	289	220	127	227	863
1923.....	385	149	241	328	1,103
Oklahoma—					
1926.....	253	104	182	398	937
1925.....	300	124	112	387	923
1924.....	179	79	73	221	552
1923.....	166	110	83	188	547
<b>Total—</b>					
1926.....	500	220	364	820	1,904
1925.....	660	281	309	768	2,018
1924.....	576	337	252	563	1,728
1923.....	654	300	393	731	2,078

*Cases of diphtheria reported during 11 months of 1926, by State health officers, compared with similar reports for the same period of the years 1925, 1924, and 1923—Continued*

	First quarter	Second quarter	Third quarter	October and No- vember	Total, 11 months
<b>Mountain:</b>					
Montana—					
1926	59	56	49	18	182
1925	129	69	51	39	288
1924	137	114	95	110	456
1923	159	80	78	105	422
Wyoming—					
1926	22	20	7	11	60
1925	20	33	25	12	90
1924	24	15	13	7	59
1923	11	10	7	31	59
Colorado—					
1926	329	218	217	182	946
1925	260	309	315	321	1,205
1924	395	496	254	217	1,362
1923	782	588	497	504	2,371
Arizona—					
1926	66	22	30	28	146
1925	48	22	8	38	116
1924	40	47	17	23	127
1923	29	48	32	38	147
<b>Total—</b>					
1926	476	316	303	239	1,334
1925	457	433	399	410	1,699
1924	596	672	379	357	2,004
1923	981	726	614	678	2,999
<b>Pacific:</b>					
Washington—					
1926	243	196	306	429	1,165
1925	593	271	229	239	1,332
1924	430	406	312	308	1,456
1923	264	274	238	239	1,015
Oregon—					
1926	275	236	174	143	828
1925	347	352	174	337	1,210
1924	377	207	270	378	1,232
1923	194	162	118	291	765
California—					
1926	1,529	1,338	1,173	1,254	5,294
1925	1,733	1,324	996	975	5,028
1924	3,618	2,995	1,851	1,695	10,159
1923	2,196	1,990	1,728	2,289	8,203
<b>Total</b>					
1926	2,047	1,770	1,653	1,817	7,287
1925	2,673	1,947	1,399	1,551	7,570
1924	4,425	3,608	2,433	2,381	12,847
1923	2,654	2,426	2,084	2,819	9,983
<b>Grand total—</b>					
1926	20,514	16,028	14,467	24,082	75,091
1925	25,289	19,534	15,594	21,413	81,830
1924	35,569	23,853	18,982	24,212	102,616
1923	37,294	23,532	24,184	37,917	122,927

## CURRENT WORLD PREVALENCE OF DISEASE

REVIEW OF THE MONTHLY EPIDEMIOLOGICAL REPORT PUBLISHED DECEMBER 15, 1926, BY THE HEALTH SECTION OF THE LEAGUE OF NATIONS' SECRETARIAT<sup>1</sup>

Only slight seasonal increases in the general mortality in European countries during October and November were indicated by the data in the December Epidemiological Report published at Geneva by the health section of the League of Nations' secretariat. Outbreaks of influenza had been reported only from England and Wales and Switzerland. In England, the number of deaths from influenza and

<sup>1</sup> From the Office of Statistical Investigations.



cases of pneumonia reported rose during the first half of the month of November, subsided quickly but started increasing again before the middle of December. In Switzerland outbreaks of mild influenza were reported from the various towns early in December, and 500 cases were reported at Berne during the week ending December 11.<sup>2</sup>

TABLE 1.—Deaths from influenza and from all causes in 105 English towns and pneumonia cases reported in England and Wales from October 3 to December 11, 1926

Two weeks ending—	Deaths from—		Pneumonia cases
	Influenza	All causes	
Oct. 16.....	74	7,709	1,378
Oct. 30.....	125	8,835	1,591
Nov. 13.....	188	9,482	2,250
Nov. 27.....	130	8,721	1,154
Dec. 11.....	120	9,417	2,330

*Plague.*—Important outbreaks of plague in southern Tunisia were reported in November and smaller outbreaks in Algeria, chiefly at Oran.

TABLE 2.—Cases of plague during November in Algeria and Tunisia

Period	Algeria			Tunisia	
	Algiers	Oran	Tarafaraoui <sup>1</sup>	Sfax district	Southern military territories
Nov. 1-10.....	0	1	0	88	6
Nov. 11-20.....	0	1	0	68	-----
Nov. 21-30.....	1	25	6	32	-----
Total.....	1	27	6	188	6

<sup>1</sup> Near Oran.

Egypt was comparatively free from the disease during November, with only 5 cases reported, all in Gharbia Province.

Greece reported one case of plague at Patras on October 28 and another in Messenia Province on November 12.

The prevalence of plague in Southern Nigeria increased considerably in September, when 305 cases were reported, as compared with 187 in August. This is the highest monthly incidence ever reported in that country.

In Madagascar, where plague had been more prevalent for several months than in previous years, no further increase in cases was indicated by the report for the first half of November.

At St. Denis, on the island of Réunion, 10 cases of plague were reported during November, and 1 case was reported in the first week of December.

<sup>2</sup> Editorial note: For later information regarding the influenza outbreak in Europe see Public Health Reports for February 4, 1927, p. 283, and this issue, p. 367.

The total number of deaths from plague reported in India for the four weeks ending October 23 was 3,592, a considerable increase over the preceding four-week period and higher than in the corresponding period of 1925. The disease was more prevalent in the Central Provinces and in Hyderabad State than in 1925, but much less prevalent in Bombay Presidency. The number of cases reported in the Punjab began to rise earlier than usual.

The seasonal increase in deaths from plague in Java was slight and the number remained lower for the month of October than for the corresponding month for several years past.

Peru reported 36 cases of plague in October as compared with 45 in September. At Guayaquil, Ecuador, 3 cases were notified in October. Argentine reported 5 cases in Cordoba Province in the week November 7-13.

One case of plague was reported from Honokaa, Hawaii.

*Cholera.*—Cholera continued to spread during November in the Province of Tonkin, in French Indo-China, and 992 cases were reported during the month as against 460 in October. A fresh outbreak of the disease also occurred in Annam in November, when 272 cases were reported, but Cochin China and Cambodia reported only a few cases. The ports Haiphong and Tourane were both seriously infected.

TABLE 3.—*Cholera cases reported in the principal maritime towns of the Far East between November 7 and December 11, 1926*

Maritime towns	Week ending—				
	November			December	
	13	20	27	4	11
Tuticorin (deaths).....	0	0	0	1	0
Negapatam (deaths).....	0	1	0	0	2
Calcutta (deaths).....	19	34	16	31	62
Rangoon (deaths).....	0	0	1	2	0
Singapore (cases).....	3	2	1	2	2
Bangkok (cases).....	2	3	0	1	2
Saigon (cases).....	1	0	0	0	1
Tourane (cases).....	10	6	1	5	9
Haiphong (deaths).....	22	27	32	15	13

In India the cholera situation improved in October and especially in Bihar and Orissa, where the deaths during the four weeks ending October 23 were only 610, compared with 2,207 in the preceding four weeks. The number of cholera deaths in the whole of British India (3,003) was practically the same during the four weeks ending October 23 as for the corresponding period of 1925.

Three cases of cholera were reported at Hiogo in Japan in the week ended November 20.

*Yellow fever.*—"Yellow fever cases continued to occur among Europeans in Senegal during the whole of November and the beginning of December," states the Report. "New extensions of the infected area, since the issue of our last Report, were Rufisque, near Dakar, Guinguineo, which is the junction of the Kaolak Railway with the main line from Dakar to the Niger, and Diourbel, on this latter railway between the two first-mentioned points."

The yellow fever cases and deaths reported during the month preceding the publication of the December Report were as follows:

TABLE 4.—*Yellow fever cases and deaths*

Locality	Date	Cases	Deaths
Africa:			
Gold Coast.....	Sept. 1-30.....	1	1
Nigeria.....	do.....	1	0
Senegal—			
Kaolak district.....	Nov. 13.....	1	1
	Nov. 16.....	1	0
Guinguineo.....	do.....	1	1
	Dec. 7.....	1	1
Rufisque.....	Nov. 27.....	1	1
	Dec. 7.....	1	1
Diourbel.....	Dec. 5.....	1	1
French Sudan—			
Segou.....	Nov. 14.....	1	1

*Typhus.*—The 20 cases of typhus reported in Poland in the week ending October 30 gave evidence that the usual seasonal increase of the disease had started in that country. In Europe and Northern Asia, typhus reaches its lowest incidence in midsummer and increases slowly during the autumn, finally reaching a peak about March.

A small outbreak of typhus was reported in Algeria in the Department of Oran in November. There were 29 cases in November as against 7 in October and 11 in September. In Tunisia, only 4 cases of typhus were reported in November.

In the Union of South Africa, 48 cases and 2 deaths were reported in September as against 100 cases and 19 deaths in August.

*Relapsing fever.*—No extension of the relapsing fever epidemic in Darfur, details of which were given in last month's Report, has been reported. The number of deaths from this disease up to November 9 was 3,721.

*Smallpox.*—The incidence of smallpox in England continued to increase during November and 353 cases were reported in the last week of the month. "It seems probable that the epidemic will reach, in December, the same high level as in January last year," says the Report. The incidence of smallpox in both England and France has been rising since 1921, as indicated by the following figures.

TABLE 5.—Cases of smallpox reported in England and France, 1921–1926

	1921	1922	1923	1924	1925	1926
England.....	315	973	2,485	3,765	5,363	<sup>1</sup> 8,306
France.....	341	172	195	210	456	<sup>1</sup> 447

<sup>1</sup> 10½ months.<sup>2</sup> 10 months.

The smallpox outbreaks in Paris in September subsided and only 4 cases were reported in the 10-day period November 21–30, and 1 case in the suburbs.

In Algeria, also, there was a marked increase in the number of smallpox cases; 290 cases were reported in November, 180 in October, and 149 in September.

The number of cases increased also in the United States during November; the reported totals in the first three weeks of November, respectively, were 233, 340, 358.

*Acute poliomyelitis.*—New cases of acute poliomyelitis declined somewhat in England and Wales during November, and 190 cases were reported in the four weeks ending November 20 as compared with 241 cases in the preceding four-week period.

In Germany, the incidence continued high and 183 cases were reported in the three weeks ending October 30. The peak of the epidemic was reached at the end of August and the disease seemed definitely to be on the wane.

*Diphtheria.*—The diphtheria morbidity showed marked seasonal increases during October and November in many European countries and in the United States. It is usual, however, for the incidence of this disease to rise during the autumn months and the rise during the past autumn was not excessive. A comparison of the incidence in recent months with 1925 is shown in the following table:

TABLE 6.—Cases of diphtheria reported in various countries in 1925 and in 1926

Four weeks ending—	England and Wales		Netherlands		Germany		Poland		Italy		Japan	
	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926
July 17.....	3,464	3,420	291	227	2,344	1,751	345	346	787	740	595	699
Aug. 14.....	3,198	3,178	269	204	2,167	1,744	310	403	714	676	382	382
Sept. 11.....	3,071	3,015	258	215	2,517	1,931	421	521	787	775	355	379
Oct. 9.....	4,002	4,193	318	210	2,706	2,354	521	665	926	1,039	660	580
Nov. 6.....	4,667	4,581	365	270	2,931	2,477	573	716	1,068	-----	853	1,029
Dec. 4.....	4,179	4,698	386	284	2,871	-----	537	-----	1,212	-----	1,092	-----

Month	Sweden		France		Czechoslovakia		Hungary		Serbs, Croats, and Slovenes		United States <sup>1</sup>	
	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926
June.....	195	200	1,001	1,052	235	271	211	301	91	72	5,664	8,547
July.....	196	317	953	1,032	265	245	189	240	84	97	4,723	3,059
August.....	283	206	692	721	241	267	208	274	81	120	5,122	3,274
September.....	316	307	607	673	299	421	224	372	120	180	6,873	5,774
October.....	376	349	842	973	466	564	359	531	198	237	11,156	9,536
November.....	433	-----	920	-----	505	-----	445	-----	171	-----	11,498	-----
December.....	352	-----	1,078	-----	473	-----	368	-----	159	-----	9,569	-----

<sup>1</sup> Data for 4-week periods in 1926, starting with the 4 weeks ending July 17.

*Scarlet fever.*—The incidence of scarlet fever continued its upward trend in Germany, Poland, Estonia, and the Netherlands during November. In each of these countries it is more prevalent than in any of the preceding four years.

TABLE 7.—Cases of scarlet fever reported in Estonia, Poland, Germany, and in the Netherlands in 1925-26

Month	Estonia		Four-weeks' period—	Poland		Germany		Netherlands	
	1925	1926		1925	1926	1925	1926	1925	1926
January.....	30	217	Jan. 31.....	2,219	2,069	3,280	3,321	777	1,068
February.....	51	195	Feb. 28.....	2,041	1,984	3,136	3,306	739	897
March.....	51	288	Mar. 28.....	1,894	1,954	2,805	2,890	709	724
April.....	36	157	Apr. 25.....	1,485	1,598	2,529	2,926	678	640
May.....	34	121	May 23.....	1,629	1,589	2,450	3,172	619	707
June.....	33	154	June 20.....	1,670	2,010	2,488	3,147	663	774
July.....	32	169	July 18.....	1,769	2,278	2,715	3,180	814	857
August.....	51	110	Aug. 15.....	1,476	2,458	2,567	3,008	743	914
September.....	57	246	Sept. 12.....	1,825	4,225	3,165	4,367	976	1,031
October.....	98	462	Oct. 10.....	2,376	5,152	3,895	5,846	1,305	1,554
November.....	134	-----	Nov. 7.....	2,668	4,681	3,818	6,497	1,378	1,857
December.....	168	-----	Dec. 5.....	2,469	-----	3,705	-----	1,203	1,891
			Jan. 2.....	1,694	-----	3,366	-----	1,087	-----

In the United States the prevalence of scarlet fever was high as compared with the previous year. There were 3,515 cases reported in the single week ending November 23.

## PLAGUE IN MONGOLIA

An outbreak of pneumonic plague was reported in Mongolia in November and December, 1926,<sup>1</sup> regarding which detailed information has been more or less incomplete and unauthoritative. The following statements are quoted from a bulletin issued January 8, 1927, by Dr. Wu Lien Teh, Director and Chief Medical Officer of the North Manchurian Plague Prevention Service, summarizing the press items and presenting the latest information regarding the situation.

1. Toward the end of November, 1926, news reached us in an indirect way regarding the probable existence of plague in Outer Mongolia. In spite of our efforts no confirmation could be obtained until the beginning of December, when reports began to appear in the Harbin newspapers apparently substantiating the news. These published detailed information about the plague supplied by travelers and chauffeurs returning from Mongolia to Manchouli. Most of them spoke at first of extensive outbreaks threatening to invade Manchuria.

2. The news contained in the newspapers may be summarized as follows: From spring, 1926, onward, a high mortality was said to have been observed among the tarbagans in Outer Mongolia. This

<sup>1</sup> Public Health Reports, Dec. 31, 1926, p. 3098, and Feb. 4, 1927, p. 359.



was at the time ascribed to the prevailing dry weather. But it might have been partly due to plague, since during the autumn (hunting season) suspicious cases were observed among marmot hunters. These were at first only isolated cases, being confined to the nomads. Later on (October-November) the epidemic seems to have invaded more populous regions. The first distributing center seems to have been between Sanpeitzu (or Sanbese, commercial center on the Kerulen River, 200 miles southwest of Manchouli on the route to Urga) and Che Chen Han (also on the Kerulen River half way between Sanpeitzu and Urga). Here the disease was said to have claimed 500 victims in two days. It was further maintained that the panic-stricken inhabitants fled and that the refugees were probably responsible for infecting two new foci—namely, Sanpeitzu, where pneumonic plague was said to prevail, and a locality 60 miles south of Urga. This spread of the disease to Sanpeitzu and westward was confirmed by a wire we received on December 13 from a supposedly reliable source at Manchouli, which spoke of serious outbreaks both at Sanpeitzu and near Urga.

3. Senior Medical Officer Chun, with a medical contingent, proceeded to Hailar and Manchouli on December 16 to investigate and adopt all necessary precautions. Neither we nor the medical department of the Chinese Eastern Railway have so far received direct official news from Mongolia; it is also doubtful whether the plague prevention bureau at Chita (Transbaikalia) has any official information. Luckily we are able to obtain reliable news from various sources and thus to provide a more or less true picture of the situation. This information may now be summarized, as follows:

- (a) There is no doubt that exceedingly dry weather prevailed in Outer Mongolia in the summer of 1926. As past experience has taught us, a close connection exists between dry weather and spread of the plague among the tarbagans.
- (b) Reports of suspicious human cases occurring between Che Chen Han and Sanpeitzu (on the caravan route from Manchouli to Urga) had reached Urga about November 20, 1926, and two Russian medical officers had prepared to leave Urga for the plague focus.
- (c) The existence of this focus seems confirmed. It appears that the Mongolian authorities took strict measures, including a cordon round this area.
- (d) News about the spread of plague to Urga is not confirmed.
- (e) Sanpeitzu was free from the disease up to December 21, 1926.
- (f) The plague had already subsided toward middle of December in the focus near Che Chen Han, and part of the medical personnel departed at that time.
- (g) A distance of 200 miles roughly separates each of the stations Manchouli, Sanpeitzu, Che Chen Han, and Urga.

4. The danger to Manchuria was never particularly great, even if the worst reports turned out true, for in addition to our precautions there is not much traffic between Manchuria and Mongolia. Caravans take at least a week to reach Manchouli from Sanpeitzu, so that individuals infected at the latter would be ill already when arriving in Chinese territory and would therefore be detected. Motor cars take only a couple of days, but these are few in number

and easily controlled; moreover, the passengers must be in good circumstances in order to afford such traveling, while the chauffeurs are all Russians. Consequently they are not likely to be in close contact with the poor Chinese in their crowded winter quarters, where the disease may assume epidemic proportions.

5. On the other hand the presumable existence of plague in Outer Mongolia, perhaps even as near as Sanpeitzu (as seemed to be the case at the time) made it necessary for our service to adopt the strictest preventive measures in Manchuria. These include:

(a) At Manchouli—

- (i) Stopping all ingress except at two points where all arrivals are medically examined.
- (ii) Refusing permits to motor cars and caravans to Mongolia.
- (iii) House to house inspection.
- (iv) Examination of passengers arriving by rail from Siberia.
- (v) Examination of Chinese Eastern Railway passengers. These measures came in full force on December 15, to be enforced for one month at least.

(b) At Hailar—

Similar measures were started at Hailar, where Doctor Liu, of the government hospital, is stationed as senior medical executive.

(c) At Dalainor (coal mines)—

Here similar precautions are carried out by the Chinese Eastern Railway, with a special physician in charge.

6. It would seem that the critical time has passed, for no further plague cases have been reported from the infected center in Mongolia since December 13. Our antiplague measures are still being enforced on the border between Manchuria and Mongolia.

## MALARIA AND EFFICIENCY IN BOMBAY

According to a recent report from the American consul in Bombay, India, that city has an acute malaria problem. Malaria is said to be prevalent in Bombay at all times of the year, but with the closing of the monsoon it takes epidemic proportions and incapacitates thousands of persons. The report states that, with few exceptions, every person in Bombay, and even throughout the entire malarial region, is at some time subject to attacks of malaria. Those who can afford it take an extended course of treatment, but the poorer classes never receive treatment long enough to effect a cure and they therefore remain a huge reservoir of infection.

During the investigation of the textile board the efficiency of the mill hands in Bombay was determined as being far below that of similar workers in Great Britain, Japan, and the United States, and their inefficiency was attributed largely to repeated attacks of malaria. The lack of robust physical health and stamina among

the students in the Bombay University has often been made the subject of remark. Doctor Paranjpye, an eminent Indian educator, in an address to the students of the University of Bombay, spoke of the "deplorable lack of manly vigor" among them.

Each year the newspapers print vigorous editorials emphasizing the material loss to business through sickness and absenteeism among employees caused by malaria and urging the municipal authorities to take the necessary measures to eradicate the disease. These protests were stronger than usual in 1926, because of the large increase in the number of cases of malaria during the year.

Following the press agitation of 1925, a conference of officials and public representatives was called and a permanent committee in charge of malaria-control work was recommended. About six months later the committee was appointed. Up to the close of 1926, however, little work had been done in malaria reduction, many factors—both racial and those peculiar to bodies controlling expenditures—contributing to the lack of accomplishment. As was once the general feeling in certain malarious sections of the United States, it is the conception of many of the people of Bombay that a certain amount of malaria is necessary and unavoidable.

As is well known, it is difficult to stamp out malaria in a thickly settled community without the cooperation of the people of that locality; and it is stated that the antimalaria work in Bombay is going to be difficult, owing to the crowded conditions in certain sections of the city and the indifference of many of the inhabitants and their disbelief in methods of malaria-control work founded on the fundamental principle of preventing malaria by preventing the breeding of mosquitoes.

In nearly all the newspaper editorials and articles dealing with the subject of malaria in Bombay, the consul states that the work done by the United States Government in Panama is held up as the great example of mosquito control, and the question is almost invariably asked, "If it can be done in Panama, why not in Bombay?"

### DEATHS DURING WEEK ENDED JANUARY 29, 1927

*Summary of information received by telegraph from industrial insurance companies for week ended January 29, 1927, and corresponding week of 1926. (From the Weekly Health Index, February 3, 1927, issued by the Bureau of the Census, Department of Commerce)*

	Week ended Jan. 29, 1927	Corresponding week 1926
Policies in force.....	66, 591, 039	63, 338, 917
Number of death claims.....	13, 132	13, 268
Death claims per 1,000 policies in force, annual rate.....	10. 3	10. 9

Deaths from all causes in certain large cities of the United States during the week ended January 29, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926. (From the Weekly Health Index, February 3, 1927, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Jan. 29, 1927		Annual death rate per 1,000 corresponding week, 1926	Deaths under 1 year		Infant mortality rate, week ended Jan. 29, 1927 <sup>1</sup>
	Total deaths	Death rate <sup>1</sup>		Week ended Jan. 29, 1927	Corresponding week, 1926	
Total (67 cities).....	7,514	13.2	14.2	782	854	<sup>2</sup> 66
Akron.....	40			8	5	80
Albany.....	35	15.2	17.5	1	5	21
Atlanta.....	79			2	8	
White.....	50			1	3	
Colored.....	29	( <sup>3</sup> )		1	5	
Baltimore.....	245	15.6	21.4	25	30	77
White.....	191		20.1	19	21	73
Colored.....	54	( <sup>3</sup> )	28.5	6	9	93
Birmingham.....	76	18.4	16.6	7	8	
White.....	32		9.8	4	1	
Colored.....	44	( <sup>3</sup> )	27.0	3	7	
Boston.....	220	14.5	15.6	24	22	67
Bridgeport.....	29			1	6	19
Buffalo.....	157	14.9	12.3	15	18	63
Cambridge.....	38	16.0	12.8	6	3	107
Camden.....	38	14.9	18.3	3	7	82
Canton.....	26	12.0	8.1	3	2	71
Chicago.....	719	12.1	12.7	76	92	66
Cincinnati.....	130	16.5	15.4	7	9	44
Cleveland.....	197	10.4	10.3	14	15	37
Columbus.....	87	15.6	14.8	7	10	65
Dallas.....	43	10.7	14.9	6	8	
White.....	35		13.6	6	8	
Colored.....	8	( <sup>3</sup> )	23.2	0	0	
Dayton.....	45	13.0	10.3	5	2	82
Denver.....	100	18.0	13.9	7	5	
Des Moines.....	36	12.6	12.9	4	2	67
Detroit.....	344	13.4	11.5	54	41	85
Duluth.....	20	9.1	10.6	4	7	86
El Paso.....	26	11.9	30.1	3	12	
Erie.....	38			1	5	20
Fall River.....	34	13.3	17.5	4	7	71
Flint.....	25	9.1	6.9	6	4	98
Fort Worth.....	45	14.3	11.5	2	3	
White.....	36		9.7	1	3	
Colored.....	9	( <sup>3</sup> )	24.7	1	0	
Grand Rapids.....	22	7.2	13.7	3	5	44
Houston.....	62			6	4	
White.....	43			5	1	
Colored.....	19	( <sup>3</sup> )		1	3	
Indianapolis.....	72	10.0	14.5	7	7	35
White.....	61		13.6	5	5	45
Colored.....	11	( <sup>3</sup> )	21.3	2	2	122
Jersey City.....	91	14.7	12.5	13	13	97
Kansas City, Kans.....	32	14.3	12.0	7	2	136
White.....	20		9.7	4	1	89
Colored.....	12	( <sup>3</sup> )	22.9	3	1	456
Kansas City, Mo.....	108	14.7	12.7	10	13	
Los Angeles.....	262			30	25	86
Louisville.....	70	11.4	12.1	7	8	60
White.....	50		12.0	4	8	39
Colored.....	20	( <sup>3</sup> )	12.2	3	0	210
Lowell.....	26	12.3	15.1	4	6	77
Lynn.....	26	12.9	9.5	1	2	26
Memphis.....	66	19.2	21.5	10	10	
White.....	33		18.8	5	4	
Colored.....	33	( <sup>3</sup> )	26.5	5	6	
Milwaukee.....	110	10.9	10.4	18	9	84
Minneapolis.....	100	11.8	11.1	11	7	62
Nashville.....	53	20.0	21.7	5	4	
New Bedford.....	21	9.2	15.7	6	9	104
New Haven.....	61	17.2	13.2	8	7	112
New Orleans.....	162	10.9	26.5	17	32	
White.....	88		21.4	10	19	
Colored.....	74	( <sup>3</sup> )	41.1	7	13	

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El Paso.....	26	11.9	30.1	3	12	
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Colored.....	20	( <sup>2</sup> )	12.2	3	0	210
Lowell.....	26	12.3	15.1	4	6	77
Lynn.....	26	12.9	9.5	1	2	26
Memphis.....	66	19.2	21.5	10	10	
White.....	33		18.8	5	4	
Colored.....	33	( <sup>2</sup> )	26.5	5	6	
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(Footnotes at end of table)

*Deaths from all causes in certain large cities of the United States during the week ended January 29, 1927, infant mortality, annual death rate, and comparison with corresponding week of 1926—Continued*

City	Week ended Jan. 29, 1927		Annual death rate per 1,000 corresponding week, 1926	Deaths under 1 year		Infant mortality rate, week ended Jan. 29, 1927
	Total deaths	Death rate		Week ended Jan. 29, 1927	Corresponding week, 1926	
New York.....	1,389	12.1	13.4	130	148	54
Bronx Borough.....	160	9.0	10.8	12	13	38
Brooklyn Borough.....	432	9.9	11.3	43	54	44
Manhattan Borough.....	621	17.8	18.8	56	64	66
Queens Borough.....	137	8.8	8.8	15	12	64
Richmond Borough.....	39	13.8	16.4	4	5	74
Newark, N. J.....	99	11.1	13.1	14	13	69
Norfolk.....	24	7.0	12.0	2	5	40
White.....	9		7.0	0	1	0
Colored.....	15	( <sup>b</sup> )	20.7	2	4	106
Oakland.....	57	11.1	16.8	7	13	82
Oklahoma City.....	33			1	1	
Omaha.....	48	11.4	14.2	6	8	67
Paterson.....	36	13.0	14.6	6	5	106
Philadelphia.....	548	14.0	16.5	48	47	64
Pittsburgh.....	180	14.6	15.0	27	22	94
Portland, Oreg.....	84			4	5	42
Providence.....	57	10.6	14.4	11	9	93
Richmond.....	54	14.7	15.2	6	8	79
White.....	33		11.7	4	3	81
Colored.....	21	( <sup>b</sup> )	23.7	2	5	76
Rochester.....	68	10.9	12.3	6	11	50
St. Louis.....	241	15.0	14.2	22	15	
St. Paul.....	51	10.6	14.3	3	2	27
Salt Lake City <sup>1</sup> .....	37	14.2	20.8	4	10	61
San Antonio.....	62	15.3	17.6	4	8	
San Diego.....	50	22.7	15.6	1	2	21
San Francisco.....	186	16.8	16.6	9	12	56
Schenectady.....	14	7.8	20.7	2	6	60
Seattle.....	81			7	2	73
Somerville.....	22	11.2	9.4	4	3	144
Springfield, Mass.....	37	13.1	13.7	5	5	77
Syracuse.....	57	15.1	10.7	6	3	77
Tacoma.....	27	13.2	10.8	1	3	24
Toledo.....	84	14.4	13.4	6	7	58
Trenton.....	44	16.7	17.5	8	2	139
Utica.....	39	19.7	18.2	1	7	23
Washington, D. C.....	148	14.3	14.3	17	12	96
White.....	96		12.3	6	5	51
Colored.....	52	( <sup>b</sup> )	20.3	11	7	202
Waterbury.....	25			5	3	118
Wilmington, Del.....	35	14.5	14.7	4	3	99
Worcester.....	51	13.6	15.1	4	7	48
Yonkers.....	23	10.1	15.7	2	6	45
Youngstown.....	40	12.3	9.8	6	6	84

<sup>1</sup> Annual rate per 1,000 population.

<sup>2</sup> Deaths under 1 year per 1,000 births. Cities left blank are not in registration area for births.

<sup>3</sup> Data for 63 cities.

<sup>4</sup> Deaths for week ended Friday, Jan. 28, 1927.

<sup>5</sup> In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Louisville, 17; Memphis, 38; New Orleans, 26; Norfolk, 38; Richmond, 32; and Washington, D. C., 25.

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

These reports are preliminary and the figures are subject to change when later returns are received by the State health officers

#### Reports for Week Ended February 5, 1927

ALABAMA		CALIFORNIA	
	Cases		Cases
Chicken pox.....	81	Cerebrospinal meningitis:	
Diphtheria.....	29	Eureka.....	1
Influenza.....	74	Los Angeles.....	1
Malaria.....	7	Oakland.....	2
Measles.....	124	San Diego.....	5
Mumps.....	21	Chicken pox.....	471
Ophthalmia neonatorum.....	1	Diphtheria.....	159
Pellagra.....	12	Influenza.....	40
Pneumonia.....	55	Jaundice (epidemic).....	7
Scarlet fever.....	18	Lethargic encephalitis:	
Smallpox.....	71	Fresno.....	1
Tuberculosis.....	33	Oakland.....	1
Typhoid fever.....	7	Measles.....	2,400
Whooping cough.....	35	Mumps.....	231
		Poliomyelitis:	
ARIZONA		San Diego.....	1
Chicken pox.....	6	San Francisco.....	1
Diphtheria.....	7	Scarlet fever.....	299
Measles.....	23	Smallpox.....	17
Mumps.....	1	Tuberculosis.....	129
Scarlet fever.....	15	Typhoid fever.....	2
Trachoma.....	1	Whooping cough.....	100
Tuberculosis.....	30		
Typhoid fever.....	2	COLORADO	
Whooping cough.....	7		
ARKANSAS		Cerebrospinal meningitis.....	2
Chicken pox.....	44	Chicken pox.....	42
Diphtheria.....	6	Diphtheria.....	9
Influenza.....	106	German measles.....	18
Malaria.....	22	Influenza.....	1
Measles.....	8	Measles.....	188
Mumps.....	89	Mumps.....	12
Ophthalmia neonatorum.....	3	Pneumonia.....	9
Pellagra.....	9	Poliomyelitis.....	2
Scarlet fever.....	7	Scarlet fever.....	176
Smallpox.....	3	Septic sore throat.....	1
Tuberculosis.....	1	Smallpox.....	17
Typhoid fever.....	5	Trachoma.....	1
Whooping cough.....	32	Tuberculosis.....	10
		Typhoid fever.....	1
		Whooping cough.....	7

CONNECTICUT		IDAHO	
	Cases		Cases
Cerebrospinal meningitis.....	1	Chicken pox.....	11
Chicken pox.....	139	Diphtheria.....	2
Diphtheria.....	35	Influenza.....	4
German measles.....	3	Measles.....	71
Influenza.....	11	Mumps.....	6
Measles.....	60	Pneumonia.....	1
Mumps.....	23	Scarlet fever.....	30
Paratyphoid fever.....	1	Septic sore throat.....	1
Pneumonia (broncho).....	38	Tuberculosis.....	1
Pneumonia (lobar).....	48	Typhoid fever.....	1
Poliomyelitis.....	1	Whooping cough.....	1
Scarlet fever.....	116		
Septic sore throat.....	2	ILLINOIS	
Tuberculosis (all forms).....	33	Cerebrospinal meningitis:	
Typhoid fever.....	1	Cook County.....	1
Whooping cough.....	40	Vermilion County.....	1
		Chicken pox.....	391
DELAWARE		Diphtheria.....	176
Chicken pox.....	4	Influenza.....	66
Diphtheria.....	2	Lethargic encephalitis:	
Influenza.....	6	Peoria County.....	1
Measles.....	1	Tazewell County.....	1
Mumps.....	1	Measles.....	1,774
Pneumonia.....	5	Mumps.....	269
Scarlet fever.....	46	Pneumonia.....	382
Smallpox.....	1	Scarlet fever.....	433
Tuberculosis.....	1	Smallpox:	
Whooping cough.....	3	Clay County.....	21
		Scattering.....	16
FLORIDA		Tuberculosis.....	324
Cerebrospinal meningitis.....	1	Typhoid fever.....	17
Chicken pox.....	30	Whooping cough.....	234
Diphtheria.....	26		
Influenza.....	11	INDIANA	
Malaria.....	3	Chicken pox.....	205
Measles.....	66	Diphtheria.....	57
Mumps.....	13	Influenza.....	51
Pellagra.....	2	Measles.....	236
Pneumonia.....	13	Mumps.....	1
Scarlet fever.....	21	Pneumonia.....	14
Smallpox.....	59	Scarlet fever.....	306
Tuberculosis.....	22	Smallpox.....	216
Typhoid fever.....	8	Tuberculosis.....	33
Typhus fever.....	1	Typhoid fever.....	2
Whooping cough.....	17	Whooping cough.....	96
GEORGIA		IOWA	
Cerebrospinal meningitis.....	5	Chicken pox.....	48
Chicken pox.....	55	Diphtheria.....	28
Diphtheria.....	24	Measles.....	745
Hookworm disease.....	2	Mumps.....	11
Influenza.....	171	Pneumonia.....	2
Malaria.....	16	Poliomyelitis—Rockwell City.....	1
Measles.....	119	Scarlet fever.....	92
Mumps.....	12	Smallpox.....	6
Paratyphoid fever.....	1	Tuberculosis.....	5
Pellagra.....	2		
Scarlet fever.....	22	KANSAS	
Septic sore throat.....	5	Anthrax.....	1
Smallpox.....	106	Cerebrospinal meningitis:	
Trachoma.....	1	Ford.....	2
Tuberculosis.....	16	Plains.....	3
Typhoid fever.....	9	Chicken pox.....	105
Typhus fever.....	4	Diphtheria.....	25
Whooping cough.....	28	German measles.....	10

## KANSAS—continued

	Cases
Influenza.....	7
Lethargic encephalitis.....	1
Measles.....	501
Mumps.....	24
Pneumonia.....	41
Poliomyelitis—Washington.....	1
Scarlet fever.....	192
Smallpox.....	29
Tuberculosis.....	33
Whooping cough.....	63

## LOUISIANA

Cerebrospinal meningitis.....	1
Diphtheria.....	21
Influenza.....	13
Malaria.....	7
Measles.....	140
Pneumonia.....	28
Scarlet fever.....	9
Smallpox.....	12
Tuberculosis.....	23
Typhoid fever.....	4
Whooping cough.....	13

## MAINE

Chicken pox.....	44
Diphtheria.....	4
German measles.....	30
Influenza.....	25
Measles.....	219
Mumps.....	13
Pneumonia.....	19
Scarlet fever.....	32
Septic sore throat.....	1
Tuberculosis.....	3
Typhoid fever.....	2
Vincent's angina.....	2
Whooping cough.....	71

MARYLAND<sup>1</sup>

Cerebrospinal meningitis.....	1
Chicken pox.....	104
Diphtheria.....	46
German measles.....	2
Influenza.....	60
Lethargic encephalitis.....	2
Measles.....	26
Mumps.....	16
Paratyphoid fever.....	4
Pneumonia (broncho).....	60
Pneumonia (lobar).....	51
Scarlet fever.....	87
Septic sore throat.....	5
Tuberculosis.....	37
Typhoid fever.....	8
Whooping cough.....	102

## MASSACHUSETTS

Cerebrospinal meningitis.....	1
Chicken pox.....	292
Conjunctivitis (suppurative).....	7
Diphtheria.....	111
German measles.....	14
Influenza.....	21
Lethargic encephalitis.....	3

## MASSACHUSETTS—continued

	Cases
Malaria.....	1
Measles.....	169
Mumps.....	293
Ophthalmia neonatorum.....	23
Pneumonia (lobar).....	113
Scarlet fever.....	450
Septic sore throat.....	2
Tuberculosis (pulmonary).....	98
Tuberculosis (other forms).....	23
Typhoid fever.....	7
Whooping cough.....	114

## MICHIGAN

Diphtheria.....	139
Measles.....	219
Pneumonia.....	157
Scarlet fever.....	348
Smallpox.....	43
Tuberculosis.....	135
Typhoid fever.....	6
Whooping cough.....	91

## MINNESOTA

Cerebrospinal meningitis.....	1
Chicken pox.....	177
Diphtheria.....	29
Measles.....	294
Pneumonia.....	6
Scarlet fever.....	275
Smallpox.....	4
Tuberculosis.....	53
Typhoid fever.....	3
Whooping cough.....	30

## MISSISSIPPI

Diphtheria.....	13
Scarlet fever.....	17
Small pox.....	48
Typhoid fever.....	9

MISSOURI  
(Exclusive of Kansas City)

Cerebrospinal meningitis.....	1
Chicken pox.....	55
Diphtheria.....	51
Influenza.....	8
Measles.....	201
Mumps.....	41
Pneumonia.....	2
Scarlet fever.....	142
Septic sore throat.....	1
Tetanus.....	1
Tuberculosis.....	24
Typhoid fever.....	5
Whooping cough.....	30

## MONTANA

Cerebrospinal meningitis.....	7
Diphtheria.....	2
German measles.....	3
Measles.....	88
Mumps.....	14
Scarlet fever.....	116
Septic sore throat.....	1
Smallpox.....	33
Tuberculosis.....	3
Whooping cough.....	47

<sup>1</sup> Week ended Friday.



## NEBRASKA

	Cases
Chicken pox.....	84
Diphtheria.....	6
German measles.....	13
Influenza.....	20
Measles.....	143
Mumps.....	73
Pneumonia.....	15
Scarlet fever.....	93
Septic sore throat.....	6
Smallpox.....	26
Tuberculosis.....	33
Typhoid fever.....	3
Whooping cough.....	41

## NEW JERSEY

Cerebrospinal meningitis.....	1
Chicken pox.....	278
Diphtheria.....	102
Influenza.....	37
Measles.....	44
Pneumonia.....	134
Scarlet fever.....	331
Typhoid fever.....	1
Whooping cough.....	200

## NEW MEXICO

Chicken pox.....	44
Diphtheria.....	2
German measles.....	23
Malaria.....	1
Measles.....	43
Mumps.....	57
Pneumonia.....	7
Poliomyelitis.....	1
Scarlet fever.....	21
Smallpox.....	2
Tuberculosis.....	27
Typhoid fever.....	3
Whooping cough.....	3

## NEW YORK

(Exclusive of New York City)

Botulism.....	1
Cerebrospinal meningitis.....	2
Chicken pox.....	467
Diphtheria.....	103
German measles.....	173
Lethargic encephalitis.....	3
Measles.....	784
Mumps.....	336
Ophthalmia neonatorum.....	2
Pneumonia.....	336
Rabies (in animals).....	2
Scarlet fever.....	334
Septic sore throat.....	9
Smallpox.....	14
Trachoma.....	1
Typhoid fever.....	18
Vincent's angina.....	23
Whooping cough.....	312

## NORTH CAROLINA

Chicken pox.....	203
Diphtheria.....	44
German measles.....	35

2 Deaths.

## NORTH CAROLINA—continued

	Cases
Measles.....	200
Scarlet fever.....	66
Septic sore throat.....	7
Smallpox.....	60
Typhoid fever.....	5
Whooping cough.....	457

## OKLAHOMA

(Exclusive of Oklahoma City and Tulsa)

Cerebrospinal meningitis—McClain County.....	1
Chicken pox.....	23
Diphtheria.....	16
Influenza.....	209
Measles.....	98
Mumps.....	13
Pneumonia.....	98
Scarlet fever.....	65
Smallpox.....	39
Typhoid fever.....	9
Whooping cough.....	16

## OREGON

Cerebrospinal meningitis.....	4
Chicken pox.....	33
Diphtheria.....	14
Influenza.....	180
Lethargic encephalitis.....	3
Malaria.....	1
Measles.....	64
Mumps.....	18
Pneumonia.....	13
Scarlet fever.....	77
Septic sore throat.....	2
Smallpox:	
Klamath County.....	12
Scattering.....	18
Tuberculosis.....	18
Typhoid fever.....	1
Whooping cough.....	14

## PENNSYLVANIA

Anthrax—Chester County.....	1
Cerebrospinal meningitis—Pittsburgh.....	1
Chicken pox.....	1,000
Diphtheria.....	335
German measles.....	71
Impetigo contagiosa.....	15
Lethargic encephalitis.....	2
Measles.....	950
Mumps.....	202
Pneumonia.....	315
Poliomyelitis—Lebanon County.....	1
Scabies.....	6
Scarlet fever.....	806
Smallpox.....	2
Tetanus—Allegheny County.....	1
Tuberculosis.....	137
Typhoid fever.....	19
Whooping cough.....	423

## RHODE ISLAND

Chicken pox.....	23
Diphtheria.....	10
Measles.....	1

## RHODE ISLAND—continued

	Cases
Mumps.....	4
Pneumonia.....	2
Scarlet fever.....	32
Tuberculosis.....	12
Whooping cough.....	3

## SOUTH CAROLINA

Chicken pox.....	79
Diphtheria.....	24
Hookworm disease.....	7
Influenza.....	684
Malaria.....	45
Measles.....	11
Pellagra.....	8
Poliomyelitis.....	1
Scarlet fever.....	11
Smallpox.....	23
Tuberculosis.....	42
Typhoid fever.....	9
Whooping cough.....	110

## TENNESSEE

Chicken pox.....	71
Diphtheria.....	19
Influenza.....	93
Malaria.....	2
Measles.....	179
Mumps.....	10
Ophthalmia neonatorum.....	2
Pellagra.....	3
Pneumonia.....	60
Poliomyelitis—Greene County.....	1
Scarlet fever.....	28
Smallpox.....	9
Tetanus.....	1
Trachoma.....	1
Tuberculosis.....	23
Typhoid fever.....	7
Whooping cough.....	80

## TEXAS

Chicken pox.....	121
Dengue.....	2
Diphtheria.....	64
Influenza.....	174
Measles.....	9
Mumps.....	18
Pellagra.....	1
Pneumonia.....	19
Scarlet fever.....	37
Smallpox.....	334
Tuberculosis.....	35
Typhoid fever.....	1
Whooping cough.....	25

## UTAH

Chicken pox.....	25
Diphtheria.....	13
Influenza.....	2
Measles.....	453
Mumps.....	2
Pneumonia.....	5
Scarlet fever.....	32
Smallpox.....	8
Whooping cough.....	1

## VERMONT

Chicken pox.....	28
Diphtheria.....	2
Measles.....	101

## VERMONT—continued

	Cases
Mumps.....	30
Scarlet fever.....	4
Whooping cough.....	11

## WASHINGTON

Cerebrospinal meningitis.....	4
Chicken pox.....	98
Diphtheria.....	10
German measles.....	50
Impetigo contagiosa.....	1
Measles.....	189
Mumps.....	69
Pneumonia.....	1
Scarlet fever.....	159
Smallpox.....	64
Trachoma.....	1
Tuberculosis.....	28
Typhoid fever.....	4
Whooping cough.....	24

## WEST VIRGINIA

Cerebrospinal meningitis—Charleston.....	1
Chicken pox.....	85
Diphtheria.....	23
Influenza.....	58
Measles.....	151
Scarlet fever.....	59
Smallpox.....	13
Tuberculosis.....	23
Typhoid fever.....	12
Whooping cough.....	92

## WISCONSIN

Milwaukee:	
Cerebrospinal meningitis.....	2
Chicken pox.....	94
Diphtheria.....	28
Influenza.....	1
Lethargic encephalitis.....	1
Measles.....	59
Mumps.....	49
Pneumonia.....	23
Scarlet fever.....	44
Whooping cough.....	25

## Scattering:

Cerebrospinal meningitis.....	5
Chicken pox.....	233
Diphtheria.....	9
German measles.....	17
Influenza.....	53
Measles.....	601
Mumps.....	102
Pneumonia.....	24
Scarlet fever.....	102
Smallpox.....	15
Tuberculosis.....	14
Typhoid fever.....	2
Whooping cough.....	115

## WYOMING

Chicken pox.....	8
Diphtheria.....	1
German measles.....	41
Influenza.....	1
Measles.....	220
Mumps.....	75
Scarlet fever.....	20
Whooping cough.....	1

## Reports for Week Ended January 29, 1927

DISTRICT OF COLUMBIA		NORTH DAKOTA—continued	
	Cases		Cases
Chicken pox.....	69	Diphtheria.....	8
Diphtheria.....	24	Lethargic encephalitis.....	2
Influenza.....	1	Measles.....	111
Measles.....	1	Mumps.....	12
Pneumonia.....	41	Pneumonia.....	6
Scarlet fever.....	32	Scarlet fever.....	60
Tuberculosis.....	18	Smallpox.....	11
Whooping cough.....	9	Tuberculosis.....	8
		Whooping cough.....	4
NORTH DAKOTA			
Cerebrospinal meningitis.....	1		
Chicken pox.....	47		

## SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those State from which reports are received during the current week:

State	Cerebrospinal meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Polio-myelitis	Scarlet fever	Smallpox	Typhoid fever
<i>December, 1926</i>										
Delaware.....		7	2		3		1	108	0	5
South Dakota.....	3	33	3		328		1	298	39	9
Virginia.....	4	307	2,732	57	285	8	2	306	54	73
Washington.....	11	172	28		810		0	498	236	24

## December, 1926

	Cases	Mumps:	Cases
Anthrax:		South Dakota.....	4
Delaware.....	3	Washington.....	259
Chicken pox:		Paratyphoid fever:	
Delaware.....	9	Washington.....	1
South Dakota.....	128	Scabies:	
Virginia.....	688	Washington.....	2
Washington.....	591	Trachoma:	
Dysentery:		South Dakota.....	1
Virginia.....	36	Whooping cough:	
German measles:		Delaware.....	11
Washington.....	124	South Dakota.....	61
Hookworm disease:		Virginia.....	1,154
Virginia.....	11	Washington.....	47
Lethargic encephalitis:			
Washington.....	1		

## GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

*Diphtheria.*—For the week ended January 22, 1927, 41 States reported 1,999 cases of diphtheria. For the week ended January 23, 1926, the same States reported 1,901 cases of this disease. One hundred and one cities, situated in all parts of the country, and having an estimated aggregate population of more than 30,900,000, reported 1,044 cases of diphtheria for the week ended January 22, 1927. Last year for the corresponding week they reported 828 cases. The esti-

mated expectancy for these cities was 1,134 cases. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

*Measles.*—Thirty-eight States reported 9,757 cases of measles for the week ended January 22, 1927, and 13,737 cases of this disease for the week ended January 23, 1926. One hundred and one cities reported 2,643 cases of measles for the week this year and 7,800 cases last year.

*Poliomyelitis.*—The health officers of 42 States reported 20 cases of poliomyelitis for the week ended January 22, 1927. The same States reported 14 cases for the week ended January 23, 1926.

*Scarlet fever.*—Scarlet fever was reported for the week as follows: Forty-two States—this year, 5,526 cases; last year, 4,945 cases; 101 cities—this year, 2,274 cases; last year, 1,705 cases; estimated expectancy, 1,334 cases.

*Smallpox.*—For the week ended January 22, 1927, 42 States reported 840 cases of smallpox. Last year for the corresponding week they reported 1,031 cases. One hundred and one cities reported smallpox for the week as follows: 1927, 121 cases; 1926, 202 cases; estimated expectancy, 133 cases. One death from smallpox was reported by these cities for the week this year—at Kansas City, Mo.

*Typhoid fever.*—Two hundred and fifty-four cases of typhoid fever were reported for the week ended January 22, 1927, by 42 States. For the corresponding week of 1926, the same States reported 252 cases of this disease. One hundred and one cities reported 41 cases of typhoid fever for the week this year and 53 cases for the corresponding week last year. The estimated expectancy for these cities was 54 cases.

*Influenza and pneumonia.*—Deaths from influenza and pneumonia were reported for the week by 95 cities, with an estimated population of more than 30,280,000, as follows: 1927, 1,184 deaths; 1926, 1,247 deaths.

## City reports for week ended January 22, 1927

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence how many cases of the disease under consideration may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1918 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland.....	75,333	26	2	1	1	0	2	0	1
New Hampshire:									
Concord.....	22,546	0	0	0	0	0	161	0	0
Manchester.....	83,607	0	2	1	0	0	3	0	3
Vermont:									
Barre.....	10,008	3	0	0	0	0	21	0	1
Massachusetts:									
Boston.....	779,620	108	66	31	4	0	37	66	33
Fall River.....	128,993	6	6	4	1	0	0	3	3
Springfield.....	142,065	6	3	7	0	1	1	0	2
Worcester.....	190,757	9	6	3	0	0	8	1	10
Rhode Island:									
Pawtucket.....	69,760	0	1	1	0	0	0	0	3
Providence.....	267,918	0	10	10	0	0	1	0	9
Connecticut:									
Bridgeport.....	(1)	3	9	4	3	0	3	1	4
Hartford.....	160,197	6	8	3	2	1	2	0	12
New Haven.....	178,927	30	3	1		0	0	4	6
MIDDLE ATLANTIC									
New York:									
Buffalo.....	538,016	39	14	8		3	1	7	21
New York.....	5,873,356	287	209	220	143	25	12	265	221
Rochester.....	316,786	10	12	16		1	5	2	8
Syracuse.....	182,003	21	7	1		0	4	7	6
New Jersey:									
Camden.....	128,642	5	5	9	0	0	1	1	2
Newark.....	452,513	39	23	13	4	0	1	30	14
Trenton.....	132,020	0	6	1	3	1	1	0	9
Pennsylvania:									
Philadelphia.....	1,979,364	142	82	90		7	6	46	81
Pittsburgh.....	631,563	61	20	29		3	68	3	35
Reading.....	112,707	14	5	2		0	1	16	3
EAST NORTH CENTRAL									
Ohio:									
Cincinnati.....	469,333	23	9	11	0	4	1	25	12
Cleveland.....	936,485	128	33	47	7	5	5	11	15
Columbus.....	279,836	24	5	12	0	4	1	0	8
Toledo.....	287,380	68	10	9	1	1	9	1	13
Indiana:									
Fort Wayne.....	97,846	3	4	2	0	1	27	0	9
Indianapolis.....	358,819	76	12	18	0	0	4	1	8
South Bend.....	80,091	7	1	0	0	0	18	0	2
Terre Haute.....	71,071	2	1	0	0	1	2	0	4
Illinois:									
Chicago.....	2,995,239	129	108	66	75	14	535	55	83
Peoria.....	81,564	7	1	3	0	1	61	6	2
Springfield.....	63,923	13	1	1	0	0	78	3	3
Michigan:									
Detroit.....	1,245,824	134	70	63	6	7	8	72	28
Flint.....	130,316	25	8	0	0	0	3	0	5
Grand Rapids.....	153,698	6	4	2	0	1	1	0	6

<sup>1</sup> No estimate made.



## City reports for week ended January 22, 1927—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha.....	50,891	18	2	1	0	0	46	33	0
Madison.....	46,385	27	0	0	0	0	1	0	0
Milwaukee.....	509,192	92	21	32	0	0	84	37	22
Racine.....	67,707	25	1	0	0	0	2	17	0
Superior.....	39,671	2	1	0	0	0	2	0	2
WEST NORTH CENTRAL									
Minnesota:									
Duluth.....	110,502	3	3	0	0	0	20	1	4
Minneapolis.....	425,435	191	23	13	0	1	1	2	9
St. Paul.....	245,001	46	16	2	0	0	17	1	9
Iowa:									
Davenport.....	52,469	1	1	0	0	0	19	0	0
Des Moines.....	141,441	0	4	4	0	0	0	1	0
Sioux City.....	76,411	12	1	0	0	0	1	0	0
Waterloo.....	36,771	17	1	0	0	0	28	0	0
Missouri:									
Kansas City.....	367,481	48	10	4	1	1	15	2	12
St. Joseph.....	78,342	1	4	1	0	0	0	0	8
St. Louis.....	821,543	24	55	48	1	0	7	6	0
North Dakota:									
Fargo.....	26,403	1	0	0	0	0	5	0	1
South Dakota:									
Aberdeen.....	15,036	8	1	0	0	0	4	0	0
Sioux Falls.....	30,127	5	1	0	0	0	1	0	0
Nebraska:									
Lincoln.....	60,941	9	2	2	0	0	8	1	2
Omaha.....	211,768	15	5	3	0	0	42	20	5
Kansas:									
Topeka.....	55,411	25	2	2	0	0	4	0	2
Wichita.....	88,367	21	4	1	0	0	0	0	6
SOUTH ATLANTIC									
Delaware:									
Wilmington.....	122,049	5	3	2	0	0	0	0	5
Maryland:									
Baltimore.....	796,296	128	32	39	39	4	4	9	58
Cumberland.....	33,741	0	1	1	0	0	0	0	2
Frederick.....	12,035	0	0	0	1	1	0	0	0
District of Columbia:									
Washington.....	497,906	64	21	13	1	1	4	0	27
Virginia:									
Lynchburg.....	20,395	11	1	2	0	1	19	0	2
Norfolk.....	(1)	8	2	1	0	0	14	2	9
Richmond.....	186,403	6	6	8	0	2	75	0	5
Roanoke.....	58,208	4	2	0	0	1	2	0	1
West Virginia:									
Charleston.....	49,019	9	2	0	1	0	0	0	1
Wheeling.....	56,208	4	1	0	0	0	0	0	7
North Carolina:									
Raleigh.....	30,371	13	1	1	0	0	3	0	2
Wilmington.....	37,061	9	1	1	0	0	2	3	2
Winston-Salem.....	69,031	14	1	1	0	0	0	5	3
South Carolina:									
Charleston.....	73,125	3	1	0	27	0	0	0	8
Columbia.....	41,225	9	1	1	0	0	1	0	0
Greenville.....	27,311	4	0	1	0	0	0	0	0
Georgia:									
Atlanta.....	(1)	3	4	12	34	1	35	0	16
Brunswick.....	16,809	0	0	0	0	0	0	0	0
Savannah.....	93,134	0	1	0	20	0	0	0	2
Florida:									
Miami.....	69,754	7	0	6	0	0	1	7	3
St. Petersburg.....	26,847	0	0	0	0	0	0	0	2
Tampa.....	94,743	6	1	6	0	0	8	0	4

<sup>1</sup> No estimate made.

## City reports for week ended January 22, 1927—Continued

Division, State, and city	Population July 1, 1925, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington.....	58,309	2	0	1	0	0	0	0	2
Louisville.....	305,935	5	7	6	3	0	1	1	25
Tennessee:									
Memphis.....	174,533	33	5	5	0	0	7	0	6
Nashville.....	136,220	6	1	0	0	1	0	0	5
Alabama:									
Birmingham.....	205,670	11	3	15	7	1	15	3	9
Mobile.....	65,955	3	1	2	0	1	17	0	1
Montgomery.....	46,481	2	1	1	0	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith.....	31,643	3	0	0	0	-----	0	1	1
Little Rock.....	74,216	2	2	1	0	0	2	0	0
Louisiana:									
New Orleans.....	414,493	3	14	10	9	6	101	0	22
Shreveport.....	57,857	17	1	2	0	0	1	5	3
Oklahoma:									
Oklahoma City.....	(1)	0	2	0	13	0	0	0	3
Texas:									
Dallas.....	194,450	16	7	18	1	2	2	7	4
Galveston.....	48,375	0	1	0	0	1	0	0	4
Houston.....	164,954	4	5	9	0	1	0	1	6
San Antonio.....	198,069	2	2	1	0	0	2	0	7
MOUNTAIN									
Montana:									
Billings.....	17,971	0	0	0	0	0	30	0	0
Great Falls.....	29,883	7	1	0	0	0	3	0	1
Helena.....	12,037	0	0	0	0	0	0	0	0
Missoula.....	12,668	1	1	0	0	0	0	17	3
Idaho:									
Boise.....	23,042	2	0	1	0	0	46	2	0
Colorado:									
Denver.....	280,911	21	11	8	-----	5	213	2	11
Pueblo.....	43,787	3	3	0	0	1	0	0	4
New Mexico:									
Albuquerque.....	21,000	4	0	1	6	0	12	11	2
Arizona:									
Phoenix.....	38,069	0	1	0	0	0	1	0	0
Utah:									
Salt Lake City.....	130,948	29	3	4	0	0	272	1	5
Nevada:									
Reno.....	12,665	0	0	0	0	0	2	0	0
PACIFIC									
Washington:									
Seattle.....	(1)	29	7	1	0	-----	3	44	-----
Spokane.....	108,897	9	4	2	0	-----	150	0	-----
Tacoma.....	104,455	12	4	7	0	0	1	0	0
Oregon:									
Portland.....	282,353	12	10	11	8	0	15	2	12
California:									
Los Angeles.....	(1)	104	45	57	16	5	156	14	25
Sacramento.....	72,260	4	3	4	3	2	88	19	4
San Francisco.....	557,530	17	22	18	3	2	116	52	10

<sup>1</sup> No estimate made.

## City reports for week ended January 22, 1927—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re-ported	Typhoid fever			Whoop- ing cough, cases re-ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
NEW ENGLAND											
Maine:											
Portland.....	3	1	0	0	0	2	1	0	0	7	17
New Hampshire:											
Concord.....	0	0	0	0	0	0	0	0	0	2	9
Manchester.....	3	1	0	0	0	0	0	0	0	0	14
Vermont:											
Barre.....	1	0	0	0	0	1	0	0	0	0	5
Massachusetts:											
Boston.....	61	158	0	0	0	11	1	1	0	15	245
Fall River.....	3	2	0	0	0	2	0	0	0	5	18
Springfield.....	9	7	0	0	0	1	0	0	0	0	31
Worcester.....	12	10	0	0	0	3	1	0	0	3	44
Rhode Island:											
Pawtucket.....	1	1	0	0	0	0	0	0	0	0	26
Providence.....	8	12	0	0	0	6	1	0	0	7	74
Connecticut:											
Bridgeport.....	8	28	0	0	0	9	0	0	0	0	35
Hartford.....	8	9	0	0	0	1	0	0	0	0	38
New Haven.....	11	3	0	0	0	1	0	0	0	0	46
MIDDLE ATLANTIC											
New York:											
Buffalo.....	25	16	1	0	0	5	1	0	0	4	163
New York.....	225	466	0	1	0	106	10	7	2	92	1,612
Rochester.....	14	21	0	0	0	2	1	0	0	6	70
Syracuse.....	15	10	0	0	0	0	0	0	0	5	48
New Jersey:											
Camden.....	5	4	0	0	0	1	0	0	0	1	25
Newark.....	26	73	0	1	0	4	1	1	0	34	98
Trenton.....	5	2	0	0	0	1	1	1	0	4	39
Pennsylvania:											
Philadelphia.....	86	131	0	0	0	26	4	2	1	31	612
Pittsburgh.....	44	20	1	0	0	11	1	0	0	20	228
Reading.....	2	5	0	0	0	0	0	0	0	7	24
EAST NORTH CENTRAL											
Ohio:											
Cincinnati.....	16	23	1	0	0	7	1	0	0	1	148
Cleveland.....	41	54	2	0	0	19	1	3	0	34	198
Columbus.....	12	12	2	1	0	7	0	0	0	2	94
Toledo.....	16	23	1	0	0	6	0	1	0	27	84
Indiana:											
Fort Wayne.....	5	7	1	3	0	0	1	0	0	1	34
Indianapolis.....	9	22	12	13	0	7	0	0	0	15	107
South Bend.....	3	6	1	0	0	0	0	0	0	0	15
Terre Haute.....	3	5	1	0	0	0	0	0	0	0	27
Illinois:											
Chicago.....	142	134	2	2	0	64	4	3	0	58	767
Peoria.....	6	2	0	0	0	0	0	0	0	3	19
Springfield.....	2	3	0	0	0	2	0	0	0	2	27
Michigan:											
Detroit.....	97	122	3	2	0	19	2	1	0	72	252
Flint.....	9	22	1	4	0	1	0	0	0	1	20
Grand Rapids.....	12	15	1	1	0	2	1	1	0	4	43
Wisconsin:											
Kenosha.....	1	19	0	0	0	0	0	0	0	11	10
Madison.....	3	9	1	0	0	0	0	0	0	6	5
Milwaukee.....	31	39	2	0	0	9	0	1	0	48	113
Racine.....	6	6	0	0	0	2	0	0	0	8	11
Superior.....	3	5	3	0	0	3	0	0	0	0	11
WEST NORTH CENTRAL											
Minnesota:											
Duluth.....	0	15	1	0	0	1	0	0	0	0	18
Minneapolis.....	52	78	15	0	0	6	1	2	0	3	103
St. Paul.....	31	33	10	0	0	3	0	0	0	16	51
Iowa:											
Davenport.....	1	1	2	0	-----	-----	0	0	-----	0	-----
Des Moines.....	7	10	2	1	-----	-----	0	0	-----	0	-----
Sioux City.....	2	7	2	3	-----	-----	0	0	-----	2	-----
Waterloo.....	2	0	1	0	-----	-----	0	0	-----	4	-----

<sup>1</sup> Pulmonary tuberculosis only.

## City reports for week ended January 22, 1927—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
WEST NORTH CENTRAL—CON.											
Missouri:											
Kansas City.....	14	32	2	11	1	4	0	0	0	7	98
St. Joseph.....	3	4	0	0	0	1	0	0	0	1	28
St. Louis.....	38	54	3	2	0	10	1	0	0	17	215
North Dakota:											
Fargo.....	1	11	1	0	0	0	0	0	0	0	12
South Dakota:											
Aberdeen.....	0	4	0	0			0	0		0	
Sioux Falls.....	2	1	1	0			0	0		0	
Nebraska:											
Lincoln.....	3	5	0	0	0	0	0	0	0	1	13
Omaha.....	5	24	9	0	0	2	0	0	0	0	43
Kansas:											
Topeka.....	3	0	1	14	0	0	0	0	0	12	12
Wichita.....	4	3	1	0	0	1	0	0	0	3	26
SOUTH ATLANTIC											
Delaware:											
Wilmington.....	3	30	0	0	0	2	0	0	0	1	31
Maryland:											
Baltimore.....	40	43	0	0	0	15	2	2	1	58	275
Cumberland.....	0	0	0	0	0	0	0	1	0	0	12
Frederick.....	0	1	0	0	0	0	0	0	0	1	3
District of Colum- bia:											
Washington.....	25	24	1	1	0	12	2	0	0	4	179
Virginia:											
Lynchburg.....	1	3	0	0	0	0	0	0	0	0	6
Norfolk.....	2	9	0	0	0	4	1	0	0	6	
Richmond.....	5	5	0	0	0	4	0	0	0	2	60
Roanoke.....	1	3	0	1	0	2	0	0	0	0	19
West Virginia:											
Charleston.....	0	4	0	0	0	0	0	0	0	6	15
Wheeling.....	1	3	0	0	0	0	0	0	0	4	20
North Carolina:											
Raleigh.....	1	4	1	0	0	0	0	0	0	17	9
Wilmington.....	0	1	0	0	0	0	0	0	0	8	13
Winston-Salem.....	1	6	4	0	0	3	0	0	0	53	16
South Carolina:											
Charleston.....	1	2	0	0	0	1	0	0	1	0	33
Columbia.....	1	1	1	3			0	0		4	
Greenville.....	1	0	0	0	0	0	0	0	0	2	1
Georgia:											
Atlanta.....	3	7	2	14	0	1	0	0	0	5	87
Brunswick.....	0	2	0	0	0	0	0	0	0	0	3
Savannah.....	1	5	1	0	0	3	1	1	1	0	30
Florida:											
Miami.....		6		2	0	0		1	0	5	30
St. Petersburg.....	0		1		0	2	0		0	18	
Tampa.....	1	2	0	0	0	1	1	0	0	0	27
EAST SOUTH CENTRAL											
Kentucky:											
Covington.....	1	4	0	0	0	0	0	0	0	0	20
Louisville.....	5	7	1	0	0	6	0	0	0	22	90
Tennessee:											
Memphis.....	5	32	2	2	0	6	0	0	0	12	
Nashville.....	2	5	1	0	0	4	0	2	0	1	59
Alabama:											
Birmingham.....	4	13	4	2	0	1	1	0	0	2	65
Mobile.....	0	2	1	0	0	3	0	0	0	0	23
Montgomery.....	1	3	1	1	0	0	1	0	0	0	9
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith.....	1	2	1	0		1	0	0		4	15
Little Rock.....	2	1	1	0	0	1	0	1	1	2	
Louisiana:											
New Orleans.....	5	7	0	0	0	16	3	0	0	0	189
Shreveport.....	0	3	2	0	0	0	0	0	0	0	20

## City reports for week ended January 22, 1927—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuber- culosis, deaths re- ported	Typhoid fever			Whoop- ing cough, cases re- ported	Deaths, all causes
	Cases, esti- mated expect- ancy	Cases re- ported	Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		Cases, esti- mated expect- ancy	Cases re- ported	Deaths re- ported		
WEST SOUTH CENTRAL—continued											
Oklahoma:											
Oklahoma City	2	0	2	2	0	2	0	0	0	0	33
Texas:											
Dallas	4	23	1	6	0	3	0	0	0	0	43
Galveston	0	2	1	1	0	0	0	0	0	0	21
Houston	2	6	1	8	0	4	0	0	0	5	59
San Antonio	0	3	0	0	0	16	1	0	0	0	69
MOUNTAIN											
Montana:											
Billings	2	0	1	0	0	0	0	0	0	0	5
Great Falls	2	15	1	0	0	0	1	0	0	0	7
Helena	1	0	0	0	0	0	0	2	0	0	4
Missoula	1	8	0	0	0	0	0	0	0	0	11
Idaho:											
Boise	2	5	0	0	0	0	0	1	0	0	5
Colorado:											
Denver	11	107	2	0	0	6	0	0	0	0	89
Fueblo	2	6	1	0	0	0	1	0	0	0	14
New Mexico:											
Albuquerque	1	3	0	0	0	7	0	0	0	2	16
Arizona:											
Phoenix	0	0	0	0	0	14	0	0	0	0	34
Utah:											
Salt Lake City	3	7	2	0	0	1	0	0	0	4	33
Nevada:											
Reno	0	2	1	0	0	0	0	0	0	0	8
PACIFIC											
Washington:											
Seattle	11	17	3	0			1	5		0	
Spokane	4	28	4	3			1	0		0	
Tacoma	3	3	3	13	0	2	0	0	0	5	25
Oregon:											
Portland	6	20	7	1	0	3	0	1	0	8	67
California:											
Los Angeles	24	52	5	6	0	18	1	2	0	8	258
Sacramento	1	0	1	1	0	1	0	0	0	0	29
San Francisco	14	22	2	1	0	14	1	1	0	13	173

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
<b>NEW ENGLAND</b>									
Massachusetts:									
Boston	0	0	1	1	0	0	0	1	0
Rhode Island:									
Providence	0	0	0	0	0	0	0	1	0
<b>MIDDLE ATLANTIC</b>									
New York:									
New York	0	0	8	3	0	0	1	2	1
New Jersey:									
Newark	0	0	0	0	0	0	1	1	0
<b>EAST NORTH CENTRAL</b>									
Ohio:									
Cincinnati <sup>1</sup>	1	0	0	0	0	0	0	0	0
Cleveland	0	0	0	0	0	0	0	1	0

<sup>1</sup> Rabies (human): 1 death at Cincinnati, Ohio, and 1 death at Atlanta, Ga.



## City reports for week ended January 22, 1927—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
<b>EAST NORTH CENTRAL—COD.</b>									
Illinois:									
Chicago.....	1	1	1	0	0	0	0	0	0
Michigan:									
Detroit.....	0	0	2	0	0	0	0	0	0
Wisconsin:									
Milwaukee.....	3	1	1	0	0	0	0	0	0
Racine.....	0	0	0	0	0	0	0	0	1
<b>WEST NORTH CENTRAL</b>									
Minnesota:									
Minneapolis.....	0	0	0	0	0	0	0	1	0
St. Paul.....	1	0	0	0	0	0	0	0	0
Missouri:									
Kansas City.....	0	0	1	1	1	1	0	1	0
<b>SOUTH ATLANTIC</b>									
Maryland:									
Baltimore.....	1	0	0	1	0	0	0	0	0
Georgia:									
Atlanta <sup>1</sup> .....	0	1	0	0	1	0	0	0	0
Savannah.....	0	0	0	0	1	1	0	0	0
Florida:									
Miami.....	0	0	0	0	0	0		1	0
<b>EAST SOUTH CENTRAL</b>									
Alabama:									
Birmingham.....	0	0	0	0	1	0	0	1	
<b>WEST SOUTH CENTRAL</b>									
Arkansas:									
Little Rock.....	1	1	0	0	0	0	0	0	0
Texas:									
Houston.....	0	0	0	0	1	1	0	0	0
<b>MOUNTAIN</b>									
Montana:									
Helena.....	2	0	0	0	0	0	0		0
Utah:									
Salt Lake City.....	2	1	0	0	0	0	0	0	0
<b>PACIFIC</b>									
Washington:									
Spokane.....	1		0		0		0	0	
Tacoma.....	1	0	0	0	0	0	0	0	0
Oregon:									
Portland.....	1	0	0	0	0	0	0	0	0
California:									
Los Angeles.....	0	0	0	0	1	0	0	0	0
San Francisco.....	0	0	0	0	0	0	0	0	1

<sup>1</sup> Rabies (human): 1 death at Cincinnati, Ohio, and 1 death at Atlanta, Ga.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended January 22, 1927, compared with those for a like period ended January 23, 1926. The population figures used in computing the rates are approximate estimates as of July 1, 1926 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 30,440,000 in 1926 and 30,960,000 in 1927. The 95 cities reporting deaths had nearly 29,780,000 estimated population in 1926 and nearly 30,290,000 in

1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, December 19, 1926, to January 22, 1927—  
Annual rates per 100,000 population, compared with rates for the corresponding period of 1925-26<sup>1</sup>

## DIPHTHERIA CASE RATES

	Week ended—									
	Dec. 26, 1925	Dec. 25, 1926	Jan. 2, 1926	Jan. 1, 1927	Jan. 9, 1926	Jan. 8, 1927	Jan. 16, 1926	Jan. 15, 1927	Jan. 23, 1926	Jan. 22, 1927
101 cities.....	122	<sup>2</sup> 163	132	177	170	<sup>2</sup> 199	146	<sup>4</sup> 187	142	176
New England.....	89	161	141	158	139	158	144	174	132	151
Middle Atlantic.....	108	139	126	171	182	183	151	177	138	192
East North Central.....	150	<sup>2</sup> 184	132	193	151	223	135	189	131	170
West North Central.....	184	113	160	105	288	189	258	159	210	147
South Atlantic.....	94	<sup>2</sup> 216	129	175	177	<sup>2</sup> 232	140	216	151	161
East South Central.....	74	150	110	187	52	138	67	250	72	153
West South Central.....	128	168	150	224	189	256	120	247	155	172
Mountain.....	166	137	111	137	182	126	128	<sup>4</sup> 122	155	117
Pacific.....	88	226	127	156	96	230	80	194	139	233

## MEASLES CASE RATES

101 cities.....	416	<sup>2</sup> 207	613	222	1,147	<sup>2</sup> 384	974	<sup>4</sup> 329	1,336	445
New England.....	1,579	168	2,406	184	3,087	253	2,861	195	2,566	548
Middle Atlantic.....	382	22	558	22	997	31	846	38	1,090	49
East North Central.....	537	<sup>2</sup> 241	753	290	1,763	416	1,303	380	2,071	516
West North Central.....	70	77	61	60	151	260	129	193	153	278
South Atlantic.....	240	<sup>2</sup> 62	470	180	1,278	<sup>2</sup> 214	1,345	203	2,457	303
East South Central.....	116	31	105	78	52	107	238	97	294	204
West South Central.....	9	103	0	13	0	189	17	306	13	453
Mountain.....	28	<sup>2</sup> 777	83	3,541	55	5,241	91	<sup>4</sup> 3,334	118	5,088
Pacific.....	36	884	47	701	64	1,521	51	1,482	64	1,346

## SCARLET FEVER CASE RATES

101 cities.....	203	<sup>2</sup> 253	225	268	209	<sup>2</sup> 319	286	<sup>4</sup> 367	292	383
New England.....	240	248	304	357	295	490	380	478	300	536
Middle Atlantic.....	146	212	108	234	210	286	238	339	237	369
East North Central.....	234	<sup>2</sup> 254	240	245	334	283	322	344	325	330
West North Central.....	438	371	509	385	583	451	557	558	678	518
South Atlantic.....	137	<sup>2</sup> 172	140	240	156	<sup>2</sup> 243	184	259	184	281
East South Central.....	168	244	100	176	119	234	140	214	202	336
West South Central.....	97	125	119	151	112	155	90	145	69	197
Mountain.....	213	974	250	892	237	953	319	<sup>4</sup> 1,161	374	1,349
Pacific.....	182	305	210	253	241	340	268	377	254	319

## SMALLPOX CASE RATES

101 cities.....	18	<sup>2</sup> 14	24	14	33	<sup>2</sup> 23	47	<sup>4</sup> 22	35	20
New England.....	0	0	0	0	0	0	0	0	0	0
Middle Atlantic.....	0	0	1	1	0	0	2	1	0	1
East North Central.....	25	<sup>2</sup> 16	23	7	48	32	37	21	33	17
West North Central.....	20	28	18	40	63	58	52	69	34	60
South Atlantic.....	10	<sup>2</sup> 30	25	41	43	<sup>2</sup> 29	67	51	56	34
East South Central.....	0	36	74	47	47	41	57	87	47	25
West South Central.....	9	20	22	22	52	42	146	25	90	63
Mountain.....	9	18	37	9	36	0	18	0	27	0
Pacific.....	130	43	152	22	110	60	284	37	193	63

<sup>1</sup> The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1926 and 1927, respectively.

<sup>2</sup> Terre Haute, Ind., and Norfolk, Va., not included.

<sup>3</sup> Norfolk, Va., not included.

<sup>4</sup> Boise, Idaho, not included.

<sup>5</sup> Terre Haute, Ind., not included.

Summary of weekly reports from cities, December 19, 1926, to January 22, 1927—  
Annual rates per 100,000 population, compared with rates for the corresponding  
period of 1925-26—Continued

## TYPHOID FEVER CASE RATES

	Week ended—									
	Dec. 26, 1925	Dec. 25, 1926	Jan. 2, 1926	Jan. 1, 1927	Jan. 9, 1926	Jan. 8, 1927	Jan. 16, 1926	Jan. 15, 1927	Jan. 23, 1926	Jan. 22, 1927
101 cities.....	9	<sup>3</sup> 11	10	12	13	<sup>3</sup> 8	11	<sup>4</sup> 9	9	7
New England.....	10	40	7	24	31	9	2	21	9	2
Middle Atlantic.....	11	5	7	7	14	6	16	8	10	5
East North Central.....	7	<sup>4</sup> 4	6	5	11	5	8	1	3	6
West North Central.....	4	10	6	4	2	8	4	6	4	4
South Atlantic.....	12	<sup>16</sup> 16	12	34	9	<sup>18</sup> 8	7	16	7	7
East South Central.....	5	16	32	21	16	25	16	15	5	10
West South Central.....	9	17	48	17	21	25	13	17	47	4
Mountain.....	18	0	9	27	9	9	9	<sup>9</sup> 9	0	27
Pacific.....	8	22	8	16	11	8	13	21	16	21

## INFLUENZA DEATH RATES

	12	<sup>3</sup> 15	15	17	21	<sup>3</sup> 20	23	<sup>4</sup> 21	20	21
95 cities.....	12	<sup>3</sup> 15	15	17	21	<sup>3</sup> 20	23	<sup>4</sup> 21	20	21
New England.....	12	7	12	21	9	16	14	14	7	5
Middle Atlantic.....	9	14	10	21	18	18	16	20	14	20
East North Central.....	8	<sup>10</sup> 10	8	15	12	17	11	16	8	25
West North Central.....	6	11	15	8	8	15	19	10	11	4
South Atlantic.....	17	<sup>34</sup> 34	19	17	15	<sup>18</sup> 18	23	24	40	20
East South Central.....	32	26	32	26	83	46	88	36	57	15
West South Central.....	48	19	44	14	44	43	75	43	88	43
Mountain.....	28	27	28	46	46	63	64	<sup>103</sup> 103	18	54
Pacific.....	15	4	40	0	57	10	46	<sup>15</sup> 15	39	31

## PNEUMONIA DEATH RATES

	136	<sup>3</sup> 137	186	163	220	<sup>3</sup> 196	211	<sup>4</sup> 180	199	183
95 cities.....	136	<sup>3</sup> 137	186	163	220	<sup>3</sup> 196	211	<sup>4</sup> 180	199	183
New England.....	165	151	213	173	245	181	208	190	210	207
Middle Atlantic.....	145	166	188	179	229	209	236	205	228	197
East North Central.....	101	<sup>111</sup> 111	145	134	177	170	153	152	139	138
West North Central.....	99	91	127	118	141	116	127	125	82	116
South Atlantic.....	205	<sup>152</sup> 152	267	186	291	<sup>237</sup> 237	278	193	289	233
East South Central.....	142	109	263	192	331	204	284	199	228	245
West South Central.....	174	90	276	151	313	241	331	181	291	202
Mountain.....	203	164	268	200	128	369	328	<sup>206</sup> 206	273	216
Pacific.....	87	149	138	199	219	210	166	<sup>178</sup> 178	184	134

<sup>1</sup> Terre Haute, Ind., and Norfolk, Va., not included.

<sup>2</sup> Terre Haute, Ind., not included.

<sup>3</sup> Norfolk, Va., not included.

<sup>4</sup> Boise, Idaho, and Tacoma, Wash., not included.

<sup>5</sup> Boise, Idaho, not included.

<sup>6</sup> Tacoma, Wash., not included.

*N* mber of cities included in summary of weekly reports, and aggregate population of  
cities in each group, approximated as of July 1, 1926 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1926	1927	1926	1927
Total.....	101	95	30,438,500	30,960,600	29,778,400	30,289,800
New England.....	12	12	2,211,000	2,245,900	2,211,000	2,245,900
Middle Atlantic.....	10	10	10,457,000	10,567,000	10,457,000	10,567,000
East North Central.....	16	16	7,644,900	7,804,500	7,644,900	7,804,500
West North Central.....	12	10	2,585,500	2,626,600	2,470,600	2,510,000
South Atlantic.....	21	20	2,799,500	2,878,100	2,757,700	2,835,700
East South Central.....	7	7	1,008,300	1,023,500	1,008,300	1,023,500
West South Central.....	8	7	1,213,900	1,243,300	1,181,500	1,210,400
Mountain.....	9	9	572,100	580,000	572,100	580,000
Pacific.....	6	4	1,946,400	1,991,700	1,475,300	1,512,800

# FOREIGN AND INSULAR

## THE FAR EAST

*Report for week ended January 8, 1927.*—The following report for the week ended January 8, 1927, was transmitted by the Eastern Bureau of the Secretariat of the Health Section of the League of Nations, located at Singapore, to the headquarters at Geneva:

Maritime towns	Plague		Cholera		Small-pox		Maritime towns	Plague		Cholera		Small-pox	
	Cases	Deaths	Cases	Deaths	Cases	Deaths		Cases	Deaths	Cases	Deaths	Cases	Deaths
Ceylon:							Dutch East Indies:						
Colombo.....	1	0	0	0	0	0	Macassar.....	0	0	0	0	0	0
British India:							Surabaya.....	1	1	0	0	0	0
Karachi.....	0	0	0	12	0		Semarang.....	1	1	0	0	0	0
Bombay.....	0	0	0	8	5		Padang.....	0	0	0	0	0	0
Madras.....	0	0	4	1	1		Siam:						
Calcutta.....	0	54	214	89			Bangkok.....	0	0	0	0	3	2
Rangoon.....	2	1	1	0			French Indo-China:						
Negapatam.....	0	0	2	0	0		Haiphong.....	0	0	6	0	0	0
Tuticorin.....	0	0	0	2	0		U. S. S. R.:						
Vitagapatam.....	0	0	0	2	1		Vladivostok.....	0	0	0	0	0	0
Straits Settlements:							Mauritius:						
Singapore.....	0	0	0	0	1	0	Port Louis.....	0	0	0	0	0	0

Telegraphic reports from the following maritime towns indicated that no case of plague, cholera, or smallpox was reported during the week:

### ASIA

*Arabic.*—Aden, Jeddah, Kamaran, Perim.  
*Iraq.*—Basrah.  
*Persia.*—Mohammerah, Bender-Abbas, Bushire.  
*British India.*—Chittagong, Cochin.  
*Portuguese India.*—Nova Goa.  
*Federated Malay States.*—Port Swettenham.  
*Straits Settlements.*—Penang.  
*Dutch East Indies.*—Batavia, Sabang, Palembang, Belawan-Deli, Cheribon, Pontianak, Tarakan, Menado, Banjermasin.  
*Sarawak.*—Kuching.  
*British North Borneo.*—Sandakan, Jesselton, Kudat, Tawao.  
*Portuguese Timor.*—Dilly.  
*French Indo-China.*—Saigon and Cholon, Tourane  
*Philippine Islands.*—Manila Iloilo, Jolo, Cebu, Zamboanga.  
*China.*—Amoy, Shanghai (International Settlement).  
*Hongkong.*  
*Macao.*  
*Formosa.*—Keelung.  
*Chosen.*—Chemulpo, Fusan.  
*Manchuria.*—Harbin, Antung, Yingkow, Changchun, Mukden.  
*Kwantung.*—Port Arthur, Dairen.  
*Japan.*—Yokohama, Osaka, Nagasaki, Niigata, Hakodate, Shimonoseki, Moji, Kobe, Tsuruga

### AUSTRALIA AND OCEANIA

*Australia.*—Adelaide, Melbourne, Sydney, Brisbane, Rockhampton, Townsville, Port Darwin, Broome, Fremantle, Carnarvon, Thursday Island.  
*New Guinea.*—Port Moresby.  
*New Britain Mandated Territory.*—Rabaul and Kokopo.  
*New Zealand.*—Auckland, Wellington, Christchurch, Invercargill, Dunedin.  
*New Caledonia.*—Noumea.  
*Fiji.*—Suva.  
*Hawaii.*—Honolulu.  
*Society Islands.*—Papeete.

### AFRICA

*Egypt.*—Port Said, Suez, Alexandria.  
*Anglo-Egyptian Sudan.*—Port Sudan, Suakin.  
*Eritrea.*—Massaua.  
*French Somaliland.*—Jibuti.  
*British Somaliland.*—Berbera.  
*Italian Somaliland.*—Mogadiscio.  
*Kenya.*—Mombasa.  
*Zanzibar.*—Zanzibar.  
*Tanganyika.*—Dar-es-Salaam.  
*Seychelles.*—Victoria.  
*Portuguese East Africa.*—Mozambique, Beira, Lourenço Marques.  
*Union of South Africa.*—East London, Port Elizabeth, Cape Town, Durban.

Reports had not been received in time for distribution from—

*Dutch East Indies.*—Samarinda, Balikpapan.

*Madagascar.*—Tamatave, Majunga.

*Reunion.*—St. Denis.

#### *Belated information*

Week ended December 18—

*French India.*—Pondicherry, cholera, 1 death.

Week ended January 1—

*Reunion.*—St. Denis, plague, 1 death.

*British India.*—Madras, plague, 2 cases. Calcutta, smallpox, 117 cases.

### ANGLO-EGYPTIAN SUDAN

*Relapsing fever.*—The following information regarding the relapsing fever epidemic in Darfur was received by the health section of the Secretariat of the League of Nations from the Sudan Medical Service:

An outbreak of relapsing fever was first reported from Kebkebia on September 11, 1926, and a similar outbreak was reported from Nyala on September 12, 1926. A provisional diagnosis of relapsing fever was made which was confirmed microscopically on September 28. By October 4, investigation had shown that the epidemic was affecting Zalingei, Western Nyala, South Masalit, and Kebkebia districts, an area of 20,000 square miles. Up to the end of November, no further extension of the area affected had been reported.

The case mortality in untreated cases is reported as being 60-80 per cent, but this is perhaps too high a figure, as many milder cases of the diseases probably remain unreported. Cases treated with novarsenobenzol usually recover.

In the areas in which it has been possible to collect statistics, the proportion of deaths to the total population averages 22.9 per cent; actually 2,092 deaths had occurred in a population of 9,105.

Quarantine delousing stations have been established, and traveling delousing groups are in operation in the infected area, which is being covered by British physicians in motor cars. Quarantine delousing stations have also been established on the main road leading east into Kordofan and on the main roads in Kordofan and the Nuba Mountains Provinces.

### CANADA

*Communicable diseases—Week ended January 22, 1927.*—The Canadian Ministry of Health reports cases of certain communicable diseases in seven Provinces of Canada for the week ended January 22, 1927, as follows:

Disease	Nova Scotia	New Brunswick	Que- bec	On- tario	Mani- toba	Sas- katch- ewan	Al- berta	Total
Cerebrospinal fever.....				3	1			4
Lethargic encephalitis.....					1			1
Influenza.....	21				2	2		25
Poliomyelitis.....			1					1
Smallpox.....				41	3	8	12	64
Typhoid fever.....		1	11	12	1		1	26



*Vital statistics—Quebec—November, 1926.*—Births and deaths in the Province of Quebec for the month of November, 1926, have been reported as follows:

Estimated population.....	2,570,000	Deaths from—Continued.	
Births.....	5,892	Diphtheria.....	58
Birth rate per 1,000 population.....	27.51	Heart disease.....	357
Deaths (all causes).....	2,535	Influenza.....	67
Death rate per 1,000 population.....	11.83	Measles.....	24
Deaths under 1 year.....	732	Scarlet fever.....	15
Infant mortality rate.....	124.23	Syphilis.....	9
Deaths from—		Tuberculosis (pulmonary).....	163
Cancer.....	133	Tuberculosis (other forms).....	40
Cerebrospinal meningitis.....	2	Typhoid fever.....	18
Diabetes.....	38	Whooping cough.....	57

#### CANARY ISLANDS

*Plague—Las Palmas—San Miguel—January 8, 1927.*—Under date of January 8, 1927, two cases of plague were reported in the Canary Islands, of which one occurred at San Miguel, 80 kilometers distant from Santa Cruz de Tenerife, and one at Las Palmas.

#### CHINA

*Pneumonic plague—Mongolia.*<sup>1</sup>—According to information received under date of January 8, 1927, the situation regarding pneumonic plague in Mongolia was stated to be less serious than reported by the press and there was no fear of an invasion of North Manchuria by the disease.

#### ECUADOR

*Plague—Guayaquil—December 16–31, 1926.*—During the period December 16 to 31, 1926, eight cases of plague with three deaths were reported at Guayaquil, Ecuador.

*Plague-infected rats.*—During the same period, of 12,653 rats taken, 53 were found plague infected.

#### EGYPT

*Plague—January 4–5, 1927.*—Plague has been reported in Egypt as follows: Gharbia Province—January 4, one case, fatal, septicemic; Charkia Province—January 5, one case, fatal, septicemic, occurring at Zagazig (Tel-el-Kebir).

*Cases of previous occurrence.*—On January 5, 1927, 10 cases of plague were reported from Marsa Matrah and vicinity, reported according to date of occurrence as follows: December 23, 1926—five cases; December 26—one case; December 27 and 29—two cases each. These cases were bubonic in type.

#### MADAGASCAR

*Plague—November 1–15, 1926.*—During the period November 1 to 15, 1926, 118 cases of plague, with 105 deaths, were reported in the Island of Madagascar. The distribution of occurrence according to

<sup>1</sup> See Public Health Reports, Dec. 31, 1926, p. 3068; February 4, 1927, p. 359; and this issue, p. 423.

type showed as follows: Bubonic—51 cases; pneumonic, 41; septicemic, 26. The occurrence was reported in three provinces, with the greatest number of cases (82) in the interior province of Tananarive, exclusive of 13 cases occurring in the town of Tananarive.

#### MALTA

*Communicable diseases—December, 1926.*—During the month of December, 1926, communicable diseases were reported in the Island of Malta as follows:

Disease	Cases	Disease	Cases
Bronchopneumonia.....	12	Pneumonia.....	5
Chicken pox.....	2	Scarlet fever.....	4
Diphtheria.....	4	Trachoma.....	19
Erysipelas.....	4	Tuberculosis.....	20
Influenza.....	4	Typhoid fever.....	45
Malta fever.....	34	Whooping cough.....	40

Population civil, estimated, 225,242.

#### POLAND

*Typhus fever—October 31–November 27, 1926.*—During the period October 31–November 27, 1926, typhus fever was reported in Poland in the districts of Bialystok, Stanislawow, and Warsaw, with 16, 52, and 45 cases, respectively, the fatalities numbering one in Bialystok, four in Stanislawow, and five in Warsaw.

*Typhus fever—Kielce district.*—During the period November 28 to December 4, 1926, 30 cases of typhus fever with 3 deaths were reported in the district of Kielce, Poland.

#### SENEGAL

*Yellow fever—Rufisque—January 2–8, 1927.*—During the week ended January 8, 1927, three fatal cases of yellow fever were reported at Rufisque, Senegal. The last case was reported January 4, 1927.

#### SPAIN

*Mortality from communicable diseases—Madrid—Year 1926.*—During the year ended December 31, 1926, 2,714 deaths from communicable diseases were reported in Madrid, Spain, in a total mortality from all causes of 15,905. The occurrence was distributed according to causes of death as follows:

Disease	Deaths	Disease	Deaths
Diphtheria.....	77	Smallpox.....	1
Measles.....	291	Tuberculosis (all forms).....	2,092
Scarlet fever.....	105	Typhoid fever.....	143

## TUNISIA

*Communicable diseases—Tunis—December 21–31, 1926.*—During the period December 21 to 31, 1926, communicable diseases were reported at Tunis, Tunisia, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis.....	1	Scarlet fever.....	4
Diphtheria.....	3	Tuberculosis.....	16
Relapsing fever.....	1	Typhoid fever.....	3

Population, estimated, 250,000.

*Plague—Sfax—Summary October–December, 1926.*—Information dated January 7, 1927, shows that for the period October–December, 1926, 304 cases of plague with 128 deaths were reported at Sfax, Tunisia, with four cases remaining under treatment December 31, 1926.

## UNION OF SOUTH AFRICA

*Plague—Orange Free State—December 12–18, 1926.*—During the week ended December 18, 1926, a case of plague was reported in the Orange Free State, occurring in a European on a farm. Direct contact with a fatal case occurring on the same farm and reported for the previous week, was stated.

## VENEZUELA

*Mortality from malaria and typhoid fever—Puerto Cabello—December, 1926.*—During the month of December, 1926, three deaths from malaria and seven from typhoid fever were reported at Puerto Cabello, Venezuela. Population, 15,000.

## YUGOSLOVIA (KINGDOM OF THE SERBS, CROATS, AND SLOVENES)

*Public Health Service.*—Information received under date of October 25, 1926, shows that the public health work in Yugoslavia is carried out through the Ministry of Public Health, which was established at the close of the war period to coordinate the various health organizations previously existing in the several divisions of the kingdom, and to create a uniform system of public health service. The ministry appointed provincial health inspectors and district physicians. The general health service is divided into two branches; the service of hygiene and the sanitary service. The functions of these two branches may be summarized as follows:

*Service of hygiene.*—This service supervises and directs the work of hospital relief, institutions of social medicine, and stations for epidemiological research and is charged with the development of physical culture and the supervision of the general medical staff.

*Social medicine.*—This branch includes the study of social disease problems and the collection and dissemination of medical data. Two central institutes of social medicine function, one at Zagreb and one at Belgrade, and the work is carried on by 100 stations operating under these central stations. The increasing number of reported cases of disease indicates a more active system of collecting data rather than increased prevalence of these diseases.

*Hospital relief.*—At the close of the year 1925 the number of hospitals in Yugoslavia and their capacity were approximately as follows:

Province	Hospitals	Beds
Bosnia-Herzegovina.....	35	2,065
Croatia-Slavonia.....	25	5,266
Dalmatia.....	10	926
Montenegro.....	6	340
Serbia and South Serbia.....	58	4,326
Slovenia.....	38	5,738
Voivodina.....	33	2,160
Total.....	205	20,821

The number of hospitals is stated to be inadequate for the present requirements of the population. The health service is endeavoring, by improving living conditions, to reduce the necessity for hospital care.

*Section of bacteriology and epidemiology.*—A report on the status of infectious diseases in Serbia in the year 1912 shows that 48 per cent of the deaths occurring in Serbia were caused by epidemic diseases. Since the unification of the Kingdom the Ministry of Public Health has been active in organizing bacteriological and epidemiological institutes throughout the country. A central institute was established at Belgrade, Serbia, for the investigation and eradication of disease. Provincial epidemiological institutes function at Sarajevo, Nish, Novi Sad, Osijekh, and Zagreb. Twenty-two bacteriological stations have been established at various points, all being branches of the provincial institutes, for the study of local conditions and for carrying on popular education in the methods of combating disease. Close attention is given to the suppression of malaria, tuberculosis, trachoma, and venereal diseases, and to the subject of child welfare.

*Malaria.*—A conservative estimate of malaria prevalence at the present time shows about one million of the population to be affected with malaria. A central institute for the study of malarial affections exists at Skopilje, to which place the institute of tropical medicine at Belgrade, which had functioned for a period of three years, was transferred. An institute for study of malaria also exists at Trogir (Dalmatia), and at two localities in the State of Macedonia stations for malarial study have been created. In addition to these units,

40 auxiliary stations or laboratories operate at different localities in the country, the entire energies of which are devoted to the eradication of malaria. The measures instituted are drainage of marshy land, the administration of quinine, propaganda, mosquito destruction, and improved sanitary conditions.

*Tuberculosis.*—Tuberculosis is stated to be widespread throughout the Kingdom. The fight against this disease is carried on mainly through 32 dispensaries situated in various parts of the country. These dispensaries give instruction in the means of avoiding infection and in caring for the tuberculous and preventing spread of the disease. Several sanatoriums exist in the Kingdom. No statistics are available as to the mortality from tuberculosis but a relatively high mortality is believed to exist.

The following table shows the reduction in the prevalence of smallpox, typhoid fever, typhus fever, and dysentery during the last seven years.

Year	Smallpox	Typhoid fever	Typhus fever	Dysentery
1919.....	5,278	12,198	-----	17,532
1920.....	4,156	1,415	1,582	11,143
1921.....	2,119	1,071	1,054	13,269
1922.....	528	268	232	2,274
1923.....	1,042	352	351	3,929
1924.....	300	404	319	3,104
1925.....	14	4,209	388	1,311

*Trachoma and rabies.*—Eighteen stations are stated to be engaged in the treatment of trachoma, and six Pasteur institutes in 1924 treated 5,705 cases. No statistics are presented for results of the treatment for trachoma.

*Venereal disease.*—Venereal disease was stated to be very prevalent in the Kingdom. The treatment is carried out through 51 specially prepared dispensaries which endeavor to locate, cure, and control cases of these diseases, and also to popularize the use of prophylactic measures.

*Infant mortality.*—Data in regard to infant mortality are not complete, but they indicate a mortality among infants of from 17 to 25 per cent depending upon regional and social conditions. A special institute for the social and hygienic protection of children has been organized at Ljubljana and for study of this subject. Special dispensaries for treatment of children have been organized at Belgrade, Novi Sad, Zagreb, Ljubljana, Subotica, Krusovac, Sarajevo, and other large towns in the Kingdom. Efforts are being made to improve sanitary conditions in maternity cases and to insure proper care of the health of children at home and in schools.

*Sanitary service.*—No organization for sanitary service existed previously to the organization of the public health service. The prob-



lems studied so far relate to the sanitation of from 20 to 30 villages annually. Adequate water supply and drainage are to be supplied in these localities and popular instruction in sanitary requirements will be conducted by means of lectures and the distribution of publications. A textbook on elementary hygiene and sanitation has been introduced into the primary and secondary schools.

### CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

The reports contained in the following tables must not be considered as complete or final as regards either the lists of countries included or the figures for the particular countries for which reports are given.

#### Reports Received During Week Ended February 11, 1927<sup>1</sup>

##### CHOLERA

Place	Date	Cases	Deaths	Remarks
India: Calcutta.....	Dec. 12-18.....	76	51	Dec. 12-18, 1926: Cases, 5; deaths, 4. Apr. 1-Dec. 18, 1926: Cases, 7,806; deaths, 5,142.
Siam.....				
Bangkok.....	Dec. 12-18.....	1		
Straits Settlements: Singapore.....	Nov. 21-Dec. 4.....	3	2	

##### PLAGUE

Algeria: Bona.....	Jan. 11.....	1		On vessel in harbor.
Brazil: Rio de Janeiro.....	Dec. 26-Jan. 1.....	1	1	
Canary Islands: Las Palmas.....	Jan. 8.....	1		
San Miguel.....	do.....	1		
Ceylon: Colombo.....	Dec. 5-11.....	1		Vicinity of Santa Cruz de Tenerife.
Ecuador: Guayaquil.....	Dec. 16-31.....	8	3	
Egypt: Charkia Province.....	Jan. 5.....	1	1	Septicemic. At Zagazig (Tel el Kebir).
Gharbia Province.....	Jan. 4.....	1	1	Septicemic.
Marsa Matrah.....	Dec. 23-29.....	10		Bubonic. Reported Jan. 5, 1927.
Java: Batavia.....	Dec. 12-18.....	15	16	Batavia Province.
Surabaya.....	Nov. 28-Dec. 4.....	1	1	
Madagascar.....				Nov. 1-15, 1926: Cases, 118; deaths 105.
Itasy Province.....	Nov. 1-15.....	6	6	Bubonic, pneumonic, septicemic.
Moramanga.....	do.....	17	11	Do.
Tananarive Town.....	do.....	13	12	Bubonic, pneumonic.
Other localities.....	do.....	82	76	Bubonic, pneumonic, septicemic.
Siem.....	Dec. 12-18.....	1	2	Apr. 1-Dec. 12, 1926: Cases, 25; deaths, 19.
Syria: Beirut.....	Dec. 11-20.....	1		European. On farm; in direct contact with fatal case reported for previous week.
Tunisia: Sfax.....	Oct. 1-Dec. 31.....	304	128	
Union of South Africa: Orange Free State— Bothaville District.....	Dec. 12-18.....	1		

<sup>1</sup> From medical officers of the Public Health Service, American consuls, and other sources.

# **CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued**

**Reports Received During Week Ended February 11, 1927—Continued**

## **SMALLPOX**

Place	Date	Cases	Deaths	Remarks
Algeria:				
Algiers.....	Dec. 21-31.....	2		
Canada:				
Alberta.....	Jan. 16-22.....	12		
Manitoba.....	do.....	3		
Ontario.....	do.....	41		
Saskatchewan.....	do.....	8		
Regina.....	do.....	1		
France:				
Paris.....	Dec. 20-31.....	3	1	
Great Britain:				
England and Wales.....	Jan. 2-8.....			Cases, 412.
Newcastle on Tyne.....	do.....	1		
Guatemala:				
Guatemala City.....	Nov. 1-30.....		1	
Do.....	Dec. 1-31.....		14	
India:				
Calcutta.....	Dec. 12-18.....	97	62	
Karachi.....	Dec. 19-25.....	1	1	
Iraq:				
Baghdad.....	Nov. 28-Dec. 4.....	1	1	
Italy:				
Genoa.....	Dec. 20-31.....	1		
Portugal:				
Lisbon.....	Jan. 2-8.....	3		
Siam:				
Bangkok.....	Dec. 12-18.....	3	1	Apr. 1-Dec. 18, 1926: Cases, 708; deaths, 296.
Sierra Leone:				
Manowa.....	Dec. 1-15.....	1		Pendembu district.
Straits Settlements:				
Singapore.....	Nov. 21-27.....	1		

## **TYPHUS FEVER**

Egypt:				
Alexandria.....	Dec. 3-9.....	1		
Japan:				
Tokyo Prefecture.....	Dec. 5-25.....	9		
Tokyo City.....	do.....	5	1	
Mexico:				
Aguascalientes.....	Jan. 9-15.....	1		
Palestine:				
Jerusalem.....	Sept. 1-30.....	4		
Do.....	Oct. 1-30.....	15		
Poland:				
District—				
Bialystok.....	Oct. 31-Nov. 27.....	16	1	
Kielce.....	Nov. 28-Dec. 4.....	30	3	
Stanislavow.....	Oct. 31-Nov. 27.....	52	4	
Warsaw.....	do.....	45	5	
Union of South Africa:				
Cape Province.....	Dec. 12-18.....			Outbreak.

## **YELLOW FEVER**

Gold Coast.....	Sept. 1-30.....	1	1	
Nigeria.....	do.....	1		
Senegal.....	Dec. 19-25.....	3	3	
Guineo.....	Dec. 7.....	1	1	
Rufisque.....	Jan. 2-8.....	3	3	

# **CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued**

**Reports Received from January 1 to February 4, 1927 <sup>1</sup>**

## **CHOLERA**

Place	Date	Cases	Deaths	Remarks
China:				
Chungking.....	Nov. 14-20.....			Present.
Tsingtao.....	Nov. 14-Dec. 11.....			Do.
Chosen.....	Sept. 1-30.....	231	143	
French Settlements in India.....	Aug. 29-Oct. 30.....	128	94	
India.....	Oct. 10-Nov. 13.....			Cases, 7,093; deaths, 4,170.
Calcutta.....	Oct. 31-Dec. 11.....	181	147	
Rangoon.....	Nov. 21-Dec. 11.....	4	3	
Indo-China.....	July 1-31.....			Cases, 2,204; deaths, 1,350. Euro-
Saigon.....	Oct. 31-Nov. 13.....	2	2	pean, 1.
Province—				
Annam.....	July, 1926.....	215	173	July, 1925; Cases, none.
Cambodia.....	.....do.....	571	352	One European, fatal. July, 1925;
Cochin-China.....	.....do.....	390	317	Cases, 3.
Kwang-Chow-Wan.....	.....do.....	220		July, 1925; Cases, 6; deaths, 2
Laos.....	.....do.....	24	21	July, 1925; Cases, 22; deaths, 15
Tonkin.....	.....do.....	784	482	July, 1925; One case.
Japan:				July, 1925; Cases, 3; deaths, 1.
Hiogo.....	Nov. 14-20.....	3		
Philippine Islands:				
Manila.....	Oct. 31-Nov. 6.....	1		
Russia.....	Aug. 1-31.....	1		
Siam.....	Oct. 31-Nov. 6.....			Case, 1.
Do.....	Apr. 1-Dec. 4.....			Cases, 7,792; deaths, 5,130.
Bangkok.....	Oct. 31-Dec. 4.....	7	2	
Straits Settlements.....	July 25-Oct. 16.....		60	

## **PLAGUE**

Algeria:				
Algiers.....	Reported Nov. 26.....	1		
Oran.....	Nov. 21-Dec. 10.....	32	22	
Tarfarsoul.....	Nov. 1-Dec. 9.....	10	9	Near Oran.
Brazil:				
Rio de Janeiro.....	Nov. 28-Dec. 4.....	2	2	
British East Africa:				
Tanganyika Territory.....	Nov. 21-27.....	6	6	
Uganda.....	Sept. 1-30.....	117	110	
Canary Islands:				
Atarfe.....	Dec. 20.....	1	1	Vicinity of Las Palmas.
Ceylon:				
Colombo.....	Nov. 14-Dec. 4.....	2	1	Two plague rodents.
China:				
Mongolia.....	Reported Dec. 21.....	500		
Nanking.....	Oct. 31-Dec. 18.....			Prevalent.
Ecuador:				
Guayaquil.....	Nov. 1-Dec. 15.....	18	5	Rats taken, 37,963; found in-
Egypt:				fect, 131.
Alexandria.....	Jan. 1-Dec. 9.....			Cases, 140.
Kafir el Sheikh.....	Nov. 19-Dec. 2.....	2		
Tanta District.....	Dec. 3-9.....	2		
Nov. 19-Dec. 20.....		3		
Greece.....	Nov. 1-30.....	10	1	Athens and Piræus.
Athens.....	Nov. 1-Dec. 31.....	9	4	
Patras.....	Nov. 28-Dec. 4.....	1	1	
Prævi.....	Nov. 27.....	1	1	Province of Drama-Kavalla.
India.....	Oct. 10-Nov. 13.....			Cases, 7,985; deaths, 4,660.
Bombay.....	Nov. 21-27.....	1	1	
Madras Presidency.....	Oct. 31-Dec. 4.....	415	212	
Rangoon.....	Nov. 14-Dec. 4.....	7	6	
Indo-China.....	July 1-31.....			Cases, 24; deaths, 10.
Province—				
Cambodia.....	July, 1926.....	6	6	July, 1925; Cases, 16; deaths, 13.
Cochin-China.....	.....do.....	8	4	July, 1925; No case.
Kwang-Chow-Wan.....	.....do.....	10		July, 1925; Cases, 22; deaths, 15.
JAVA:				
Batavia.....	Nov. 7-Dec. 11.....	48	45	Province.
Surabaya.....	Oct. 24-Nov. 6.....	8	8	

<sup>1</sup> From medical officers of the Public Health Service, American consuls, and other sources.

# **CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued**

## **Reports Received from January 1 to February 4, 1927—Continued**

### **PLAGUE—Continued**

Place	Date	Cases	Deaths	Remarks
Madagascar:				
Province—				
Analalava.....	Oct. 16-31.....	1	1	Bubonic.
Iasy.....	do.....	2	2	
Maevatanana.....	do.....	10	10	
Moramanga.....	do.....	21	15	
Tamatave.....	do.....	3	1	
Tananarive.....	do.....	13	13	Cases, 85; deaths, 70.
Tananarive Town.....	do.....	492	441	
Nigeria.....	Aug. 1-Sept. 30.....			Cases, 24; deaths, 4.
Peru.....	Nov. 1-30.....			
Departments—				
Cajamarca.....	do.....			Present.
Ica—				
Chincha.....	do.....	1		
Lambayeque.....	do.....			Present in Province.
Chiclayo.....	do.....	3		
Lima.....	do.....	10	3	Cases, 30; deaths, 4. Present in
Canete Province.....	do.....	3		Cajatambo and Chancay Prov-
Chancay Province.....	do.....	7	1	inces.
Lima Province.....	do.....			
Portuguese West Africa:				
Angola—				
Benguela.....	Oct. 16-31.....	8	4	
Portugal:				
Lisbon.....	Nov. 23-26.....	3	2	In suburb of Balem.
Russia.....	May 1-June 30.....	44		
Do.....	July 1-Aug. 31.....	19		
Senegal.....	July 1-31.....	178	162	
Diourbel.....	Nov. 20-30.....	12	1	
Tivaouane.....	Dec. 19-25.....	6	2	In interior.
Syria:				
Beirut.....	Nov. 11-Dec. 10.....	2		
Tunisia.....	Nov. 1-30.....	188		
Turkey:				
Constantinople.....	Dec. 15-25.....	1		
Union of South Africa:				
Cape Province—				
De Aar District.....	Nov. 21-27.....	1		Native.
Hanover District.....	Nov. 14-20.....	1		Native. On farm.
Middleburg District.....	Dec. 5-11.....	1	1	Do.
Orange Free State.....	do.....			Cases, 12; deaths, 2.
Bothaville District.....	do.....	1	1	European.
Hoopstad District.....	Nov. 7-13.....	1	1	Native.
Do.....	Dec. 5-11.....	1	1	Do.

### **SMALLPOX**

Algeria.....	Sept. 21-Nov. 20.....			Cases, 477.
Algiers.....	Dec. 11-20.....	2		
Arabia:				
Aden.....	Dec. 12-18.....	1		Imported.
Belgium.....	Oct. 1-10.....	1		
Brazil:				
Bahia.....	Oct. 30-Dec. 18.....	12	8	
Para.....	Oct. 31-Nov. 6.....		1	
Pernambuco.....	Oct. 17-Dec. 11.....	87	3	
Rio de Janeiro.....	Nov. 14-Dec. 25.....	140	64	
Sao Paulo.....	Aug. 23-Oct. 24.....	12	9	
British East Africa:				
Tanganyika Territory.....	Oct. 31-Nov. 20.....	2		
Zanzibar.....	Oct. 1-31.....	23	12	
British South Africa:				
Northern Rhodesia.....	Nov. 27-Dec. 3.....			Cases, 200. In natives.
Canada.....	Dec. 5-Jan. 1.....			Cases, 155.
Do.....	Jan. 2-15.....	72		
Alberta.....	Dec. 5-Jan. 1.....	132		
Do.....	Jan. 2-15.....	16		
Calgary.....	Nov. 28-Dec. 25.....	12		
Do.....	Jan. 2-17.....	7		
Edmonton.....	Dec. 1-31.....	4		
Manitoba.....	Dec. 5-Jan. 1.....	9		
Do.....	Jan. 2-15.....	4		
Winnipeg.....	Dec. 19-25.....	1		
Do.....	Jan. 2-22.....	3		

# **CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued**

**Reports Received from January 1 to February 4, 1927—Continued**

## **SMALLPOX—Continued**

Place	Date	Cases	Deaths	Remarks
<b>Canada—Continued.</b>				
Ontario.....	Dec. 5-Jan. 1.....	96		
Do.....	Jan. 2-15.....	46		
Kingston.....	Jan. 1-7.....	1		
Ottawa.....	Dec. 12-31.....	5		
Do.....	Jan. 9-15.....	1		
Toronto.....	Dec. 14-25.....	14		
Do.....	Jan. 1-15.....	25	1	
Saskatchewan.....	Dec. 5-Jan. 1.....	18		
Do.....	Jan. 2-15.....	7		
<b>China:</b>				
Chungking.....	Nov. 7-Dec. 11.....			Present.
Foochow.....	Nov. 7-Dec. 25.....			Do.
Hankow.....	Nov. 6-30.....			Do.
Manchuria—				
Harbin.....	Dec. 16-22.....	1		
Mukden.....	Dec. 5-11.....	1		
Swatow.....	Nov. 21-27.....			Do.
Nanking.....	Dec. 12-25.....			Do.
Chosen.....	Aug. 1-Sept. 30.....	42	14	
Seoul.....	Nov. 1-30.....	2		
<b>Egypt:</b>				
Cairo.....	June 11-Aug. 26.....	27	4	
Estonia.....	Oct. 1-30.....	2		
France.....	Sept. 1-Oct. 31.....	165		
Paris.....	Dec. 1-20.....	7	2	
French Settlements in India.....	Aug. 29-Nov. 30.....	83	83	
<b>Germany:</b>				
Stuttgart.....	Nov. 28-Dec. 4.....	7		
Gold Coast.....	Aug. 1-31.....	41	5	
<b>Great Britain:</b>				
England and Wales.....	Nov. 14-Jan. 1.....			Cases, 2,262.
Newcastle-on-Tyne.....	Dec. 5-11.....	2		
Sheffield.....	Nov. 28-Jan. 1.....	60		
Greece.....	Nov. 1-30.....	20		
Athens.....	Dec. 1-31.....	14	2	
<b>India.....</b>				
Oct. 10-Nov. 13.....				Cases, 3,967; deaths, 968.
Bombay.....	Nov. 7-Dec. 18.....	22	16	
Calcutta.....	Oct. 31-Dec. 11.....	142	98	
Madras.....	Nov. 21-Dec. 25.....	23	2	
Rangoon.....	Nov. 28-Dec. 11.....	1	1	
<b>Indo-China.....</b>				
July 1-31.....				Cases, 29; deaths, 10.
<b>Province:</b>				
Annam.....	July, 1926.....	6	3	July, 1925: Cases, 39; deaths, 7.
Cambodia.....	do.....	11	4	July, 1925: Cases, 62; deaths, 18.
Cochin-China.....	do.....	6	1	July, 1925: Cases, 12; deaths, 7.
Laos.....	do.....	3	1	July, 1925: Cases, none.
Tonkin.....	do.....	3	1	July, 1925: Cases, 31; deaths, 3.
<b>Iraq:</b>				
Baghdad.....	Oct. 31-Nov. 20.....	3	2	
Basra.....	Nov. 7-13.....	1	1	
<b>Italy.....</b>				
Aug. 29-Oct. 23.....		12		
<b>Jamaica.....</b>				
Nov. 26-Dec. 25.....		34		Reported as alastrim.
<b>Japan:</b>				
Kobe.....	Nov. 14-20.....	1		
Yokohama.....	Nov. 27-Dec. 3.....	2		
<b>Java:</b>				
Batavia.....	do.....	2		Province.
Surabaya.....	Oct. 24-Nov. 27.....	10	1	
Luxemburg.....	Nov. 7-30.....	1		
<b>Mexico.....</b>				
July 1-Aug. 31.....			331	
Chihuahua.....	Dec. 31.....			Several cases; mild.
Ciudad Juarez.....	Dec. 14-27.....		2	
Mexico City.....	Nov. 21-Dec. 25.....	6		Including municipalities in Federal District.
Do.....	Dec. 26-Jan. 8.....	1		Do.
San Luis Potosi.....	Nov. 12-Dec. 18.....		3	
Do.....	Jan. 9-15.....		2	
Torreón.....	Nov. 28-Jan. 1.....		12	
Do.....	Jan. 2-8.....		4	
Nigeria.....	Aug. 1-Sept. 30.....	61	3	
<b>Peru:</b>				
Arequipa.....	Dec. 1-31.....			Present.
Poland.....	Oct. 11-30.....			Cases, 30.
<b>Portugal:</b>				
Lisbon.....	Nov. 22-Jan. 1.....	43	4	
<b>Portuguese West Africa:</b>				
Angola.....	Oct. 1-15.....			Present in Congo district.
Rumania.....	Jan. 1-Sept. 30.....	7	1	



# **CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued**

**Reports Received from January 1 to February 4, 1927—Continued**

## **SMALLPOX—Continued**

Place	Date	Cases	Deaths	Remarks
Russia.....	May 1-June 30.....	705	-----	
Do.....	July 1-Aug. 31.....	629	-----	
Siam.....	Apr. 1-Dec. 4.....	-----	-----	Cases, 697; deaths, 261.
Bangkok.....	Oct. 31-Dec. 4.....	18	6	
Straits Settlements:				
Singapore.....	Oct. 31-Nov. 20.....	2	-----	
Tunisia.....	Oct. 1-Nov. 20.....	7	-----	
Union of South Africa:				
Cape Province:				
Caledon district.....	Dec. 5-11.....	-----	-----	Outbreaks.
Steynsburg district.....	do.....	-----	-----	Do.
Stutterheim district.....	Nov. 21-27.....	-----	-----	Do.
Natal:				
Durban district.....	Nov. 7-27.....	9	-----	Including Durban municipality.
				Total from date of outbreak;
				cases, 62; deaths, 16.
Orange Free State:				
Bothaville district.....	Nov. 14-27.....	-----	-----	Outbreaks.
Transvaal:				
Johannesburg.....	Nov. 21-27.....	2	-----	Do.
	Nov. 7-20.....	1	-----	Europeans.
	Nov. 14-20.....	1	-----	
Yugoslavia.....	Nov. 1-30.....	1	1	

## **TYPHUS FEVER**

Algeria.....	Sept. 21-Nov. 20.....	22	-----	
Bulgaria.....	July 1-Oct. 31.....	23	3	
Chile:				
Valparaiso.....	Nov. 21-Dec. 25.....	6	-----	
China:				
Antung.....	Nov. 22-Dec. 5.....	4	-----	
Chefoo.....	Oct. 24-Nov. 6.....	-----	-----	Present.
Chosen.....	Aug. 1-Sept. 30.....	15	-----	
Seoul.....	Nov. 1-30.....	1	-----	
Gold Coast.....	Sept. 1-30.....	1	1	
Greece:				
Athens.....	Nov. 1-Dec. 30.....	15	2	Cases, 12.
Italy.....	Aug. 29-Sept. 23.....	3	-----	
Lithuania.....	Sept. 1-Oct. 31.....	17	2	
Mexico:				
Mexico City.....	July 1-Aug. 31.....	-----	-----	Deaths, 46.
	Dec. 5-11.....	3	-----	Including municipalities in Fed-
				eral District.
Do.....	Jan. 2-8.....	4	-----	Do.
Nigeria.....	Sept. 1-30.....	1	-----	
Palestine:				
Beisan.....	Dec. 21-27.....	1	-----	
Haifa.....	Nov. 23-Dec. 13.....	5	-----	
Jaffa.....	Nov. 23-Dec. 20.....	6	-----	
Nazareth.....	Nov. 16-Dec. 20.....	7	-----	
Peru:				
Arequipa.....	Dec. 1-31.....	-----	-----	Present.
Poland.....	Oct. 11-Nov. 13.....	-----	-----	Cases, 82; deaths, 8.
Rumania.....	Aug. 1-Oct. 31.....	114	6	
Russia:				
Do.....	May 1-June 30.....	6,043	-----	
	July 1-Aug. 31.....	2,364	-----	
Turkey:				
Constantinople.....	Dec. 12-25.....	3	-----	
Tunisia.....	Oct. 1-20.....	3	-----	
Union of South Africa:				
Cape Province.....	Oct. 1-30.....	-----	-----	Cases, 71; deaths, 8.
Do.....	do.....	47	7	
East London.....	Nov. 14-Dec. 4.....	-----	-----	Outbreaks.
Port St. Johns district.....	Nov. 21-27.....	1	-----	Native. Imported.
Natal.....	Dec. 5-11.....	-----	-----	Outbreak. On farm.
Orange Free State.....	Oct. 1-31.....	1	-----	
Transvaal.....	do.....	22	1	
Yugoslavia.....	Nov. 1-30.....	1	-----	

## **YELLOW FEVER**

French Sudan.....	Dec. 19-25.....	1	1	
Gold Coast.....	Aug. 1-31.....	7	2	
Senegal.....	Dec. 19-25.....	3	3	
Diourbel.....	Dec. 6.....	1	1	In European.
Rufisque.....	Nov. 27.....	1	1	
Upper Volta:				
Gaona district.....	Oct. 25.....	2	-----	